Enforcement Confidential Materials Attached

MEMORANDUM

DATE: September 23, 2008

SUBJ: Request for a Non-Time Critical Removal Action at the Nuclear Metals, Inc. Superfund Site, Concord, Massachusetts -- **ACTION MEMORANDUM**

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TO: James T. Owens, III, Director
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I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of a non-time critical removal action (NTCRA) for the Nuclear Metals, Inc. Superfund Site (the "Site"), located at 2229 Main Street, Concord, Massachusetts. This Action Memorandum also requests and documents the approval of a "consistency" exemption from the $2 million and 12 month statutory limits for Fund-financed sites. This NTCRA is expected to be completed within 36-48 months of mobilization at a cost of approximately $64 million. The NTCRA is necessary to prevent, minimize, stabilize, and mitigate potential threats to human health and the environment posed by a release of hazardous substances to the environment.

In particular, the NTCRA will address the threats posed by on-site deteriorating facility buildings and structures severely contaminated with depleted uranium by demolishing the buildings down to the slab foundations and leaving the slab foundation in place at this time. Building slabs will be temporarily capped pending future remedial actions, and disposal of demolition debris will either be off-site in an appropriately-licensed facility or potentially on-site if such debris is found not to contain hazardous or radioactive substances. The NTCRA is consistent with the long-term remedial strategy for this Site to minimize exposure to and migration of contaminants.

This NTCRA will ensure that EPA can provide a timely response to effectively minimize threats to public health or welfare or the environment which may result from the continuing release and/or threat of release of hazardous substances at and from the contaminated facility buildings and structures.

While the NTCRA will accelerate the overall site cleanup by reducing site contamination, it may not constitute the complete and final cleanup plan for the Site. EPA is in the process of overseeing a Remedial Investigation/Feasibility Study (RI/FS) to evaluate the full nature and extent of contamination at the Site not addressed by this NTCRA, prior time-critical removal actions, or the prior removal action by the Massachusetts Department of Environmental Protection (MADEP). The Record of Decision (ROD) that will document the remedial cleanup is targeted for the end of 2010.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS Identifier: MAD062166335
Site Identifier: 017D
Removal Category: Non-Time Critical
NPL status: Listed on NPL on June 14, 2001

A. Site Description

1. Removal site evaluation

The Site consists of approximately 46 acres, which includes a two-story, five-section interconnected building (Buildings A, B, C, D, and E), a tank house, a hydrogen peroxide tank house, two gas cylinder storage huts, and four "Butler" metal storage buildings, which altogether have a current footprint of approximately 185,000 square feet (see Figure 2.1.3). Other areas of the Site not addressed by this removal action are: a sphagnum bog, the northeast wetland, a cooling water recharge pond, a "sweepings" pile, and a small landfill and holding basin (which have both been covered with a temporary cap by EPA as part of a 2002 time-critical removal action). The Site owner/operator, Starmet Corporation ("Starmet"), is licensed by the Massachusetts Department of Public Health Radiation Control Program ("MADPH-RCP") to possess radioactive materials at the Site. Starmet, however, is no longer licensed to manufacture or process products containing radioactive material. Starmet and related entities (the "Starmet Parties") currently perform small-scale operations at the Site, including production of beryllium-aluminum alloys and steel powders. Under its license, Starmet is required to decommission the facility and meet MADPH-RCP regulatory requirements for the cleanup of the Site, including the cleanup of the facility buildings.

In May 2007, MADPH-RCP and Starmet entered into a Consent Decree under which Starmet agreed to permanently vacate the Site by October 31, 2007. Starmet has not left the Site to date; however, it is in discussions with MADPH-RCP regarding its departure. Starmet is also engaged in discussions with EPA regarding its departure from the Site. Starmet is currently providing site security, which includes the provision of on-site security guards, and maintaining heat, electricity, fire alarm and suppression systems, and water treatment systems.

Currently, most of the facility is inactive and all of the manufacturing work being performed is reportedly done in small sections of Building B, C, and D. Portions of the rest of the facility's buildings are used for office, shipping and storage space. The majority of these buildings are contaminated with radioactive depleted uranium. Levels of removable (via swipe samples) and/or fixed (within building materials) radioactivity found on floors and walls range from 4,000 disintegrations per minute (dpm) per 100 centimeter squared (dpm/100 cm^2) to as high as 4 million dpm/100 cm^2. The MADPH-RCP unrestricted release criterion for decommissioning radioactive-licensed facilities of 10 millirem per year Total Effective Dose Equivalent (millirem/yr TEDE) [1] would equate to a removable surface contamination level of less than 40 dpm/100 cm^2. High levels of contamination are also found on the roof of the facility buildings. The buildings are in a state of disrepair, including, but not limited to: contaminated roofs that are severely leaking in all of the five interconnected buildings, water from the roofs of the buildings coming into contact with poorly maintained electrical wiring, contaminated floors, and equipment, and the presence of contaminated equipment throughout the facility buildings.

As a licensed facility requiring decommissioning in accordance with the MADPH-RCP decommissioning requirements (10 millirem/yr TEDE) under 105 CMR 120.245, the buildings would eventually have to be demolished due to the high levels of contamination found on and in the buildings. Demolition is the only alternative that in the long-term will meet the decommissioning requirements for the following reasons: 1) the radioactive material contamination is so extensive that the decontamination of the facility building materials would be cost-prohibitive and in the end could still fail to meet decommissioning requirements; 2) the floor drains and septic systems leading outside the buildings are contaminated with depleted uranium and therefore it is likely that the floor drains, piping, and plumbing underneath the facility are also contaminated and will require further assessment and possible removal as part of the final remedy for the site; 3) the structural integrity of the buildings continues to deteriorate and would require costly renovations beyond decontamination, including new roofs, plumbing, and electrical systems; 4) due to the deteriorating condition of the buildings there is a potential for collapse of the buildings due to disrepair or fire; and 5) there is no anticipated re-use of the buildings post-remedy.

A small fire occurred at the facility on June 26, 2007. According to representatives of Starmet and the Town of Concord Fire Department, the fire self-ignited in Building C, from a possible interaction of pyrophoric metal scrap cuttings that were improperly stored for disposal. The facility's sprinkler and fire alarm systems self-activated, largely extinguishing the fire before Concord Fire Department's arrival. Upon arrival at the Site, the firefighting crews finished extinguishing the remainder of the fire.

The area where the fire occurred was known to contain residual levels of depleted uranium contamination, as well as drums and other containers of unidentified process waste and raw materials. Based on various investigations following the fire, the Concord Fire Department requested assistance from EPA to remove hazardous materials from the facility due to a threat to

[1] TEDE is calculated by adding the external deep dose equivalent to the internal committed effective dose equivalent.

public health and safety. EPA is currently conducting a time-critical removal action which will address the hazardous and flammable materials in the building. Nevertheless, in the event of a large scale fire or building collapse, a release of contamination from the facility buildings could pose a hazard to the community and the environment.

EPA signed an approval memorandum for performance of an Engineering Evaluation and Cost Analysis (EE/CA) in December 2007 (attached as Appendix A) to evaluate various alternatives to address the on-site facility buildings and structures. The EE/CA associated with the NTCRA was performed by potentially responsible parties (PRPs) pursuant to an Administrative Order by Consent for RI/FS, signed on June 13, 2003. The EE/CA was completed in February 2008. The EE/CA and the EE/CA approval memorandum can be found in the administrative record for the NTCRA and on the Nuclear Metals EPA website: http://www.epa.gov/region1/superfund/sites/nmi. EPA anticipates that performance of the NTCRA would be performed on a PRP-lead basis.

In addition, in accordance with the national guidance document "Use of Non-Time Critical Removal Authority in Superfund Response Actions", dated February 14, 2000, EPA Region 1 has consulted with the Office of Superfund Remediation and Technology Innovation (OSRTI) and the Office of Emergency Management (OEM) based on the anticipated cost of the NTCRA being greater than $6 million. (The OSRTI concurrence letter is also included in Appendix A.) Furthermore, due to the potential high cost of the NTCRA, the National Remedy Review Board (NRRB) reviewed the preliminary options and costs for performing a NTRCA, and provided recommendations to EPA Region 1 in spring 2007. The NRRB recommendations and EPA Region 1's response to the recommendations are included as Appendix B.

In April 2008, EPA issued a fact sheet to the local communities, seeking comments on the NTCRA proposal to demolish the site buildings. On May 15, 2008, EPA held a public meeting to discuss the alternatives in the EE/CA and discuss EPA's preferred alternative for the demolition of the facility buildings. From May 13th to June 12th, 2008 EPA held a public comment period. Responses to significant comments are provided in Appendix C. Additional supporting documentation can be found in the Administrative Record.

2. Physical location

The Site is located at 2229 Main Street, in Concord, Massachusetts. The entire property consists of approximately 46 acres, including five interconnected buildings, a tank house, a hydrogen peroxide tank house, four "Butler" buildings, and two gas cylinder storage huts. The property is bordered by residential properties to the east and northeast, a commercial property to the west, Main Street (Route 62) to the north and to the south and southwest by conservation land/woodlands and the Thoreau Hills Summer Camp (a children's day camp).

The closest residence is located within 200-300 feet of the Site. The Assabet River is approximately 300 feet north from the northern perimeter of the property. Both the town of

Concord and the adjacent town of Acton are on public water supplies that have not been impacted by site-contaminated groundwater.

3. Site characteristics

From 1958 to the present, the Site was used by various operators as a specialized research and metal manufacturing facility, which was licensed to possess radioactive substances. At various times, Site operators used depleted uranium, beryllium, titanium, zirconium, copper, acids, solvents, and other substances. Since 1972, Starmet, formerly known as Nuclear Metals, Inc., or one of its wholly-owned subsidiaries, has owned and/or operated the Site. Starmet is licensed to possess radioactive materials by the MADPH-RCP, under a Nuclear Regulatory Commission (NRC) "agreement state" license. Starmet previously manufactured penetrator bullets from depleted uranium as a defense contractor for the U.S. Army. In addition to the various buildings and structures that will be addressed under this NTCRA, other areas of the Site currently being investigated as part of the RI/FS include: site soils, site groundwater, a cooling water recharge pond, a sphagnum bog, the northeast wetland, the former waste holding basin, a small landfill, and a waste pile referred to as the "sweepings" pile that contains dredged material from the cooling water recharge pond.

The Starmet Parties are currently working in the facility building at the Site. These businesses reportedly occupy less than 20% of the facility's floor print and employ approximately 40 – 45 people. The operations inside the facility building include beryllium alloys and metal powders operations.

The facility buildings are in poor condition. Buildings A, B, and C were constructed in 1958; Building D was constructed in 1978; and Building E was constructed in 1983. The layout of the buildings described in this section can be found in Figures 2.3.2.1 a and b of the EE/CA, also included herein. An evaluation of the structural condition of the roofs of all buildings was conducted by a consultant under contract with MADPH-RCP (Emanuel Engineering, Inc., March 2004) (the "*Roof Evaluation*"). In many areas, the roofs are approaching 50 years old. This evaluation found that water penetration due to roofing failure has and continues to occur in most buildings, most notably in Buildings A, B and C. In addition, given their current condition, continued deterioration of the roofs, if not addressed, could lead in the future to significant structural problems for the buildings. For example, snow and ice accumulation could further strain critical structural roof joists which could lead to partial roof collapse. This scenario is likely, and is indicated as a potential serious problem in the *Roof Evaluation.* Specifically, the report states:

> "...water penetrations are primarily caused for two reasons: the failure of the existing roofing, which is very old and deteriorated, extensively patched, and has been penetrated numerously over many years; and the lack of a fast and proper water drainage due to inadequate and improper roof drains and slopes. (sic) Water penetrations have created various conditions of rust in the roof metal deck from minor – surface only, to major – complete loss of material. These conditions, in general, are not considered likely to cause roof collapse under the snow load at this

time, however, if left untreated, they will result in structural conditions that are dangerous and likely to produce collapse or partial collapse of the roof system."

Building A

Building A was constructed in 1958, and is one of the original three facility buildings. The building is 216-ft by 80-ft with two floors. The building consists of office space, as well as production and research space. The building was designed with laboratories for metallography, applied physics, analytical chemistry, physical metallurgy, and chemical metallurgy, as well as shops for glass production and machine work. According to Starmet personnel, during the period of high-volume production of depleted uranium penetrators, office spaces within Building A were converted to use for quality inspection and other industrial uses. Later, these areas were converted back to office spaces. All of Building A is currently accessible to all workers in the facility and partially occupied by one or more of the Starmet Parties. Current uses include office space, final product quality control, and research and development.

The *Roof Evaluation* found a variety of leaks in the Building A roof, and one area of deteriorated roof decking. The area of deteriorated decking, where access is restricted, is indicated on EE/CA Figure 2.3.2.1.c, included herein.

Building B

Building B was constructed in 1958 and is one of the original three facility buildings. It is a 97-ft by 60- ft two-story building that houses the boilers and services for the plant. Other portions of the building were used for a medical clinic, lunch / conference room, and locker rooms. The boiler room reportedly contained a sump that periodically discharged into the cooling water recharge pond. Currently, the lunch area, boiler room, and sections of the former locker rooms are occupied by one or more of the Starmet Parties.

The *Roof Evaluation* found a variety of leaks in the Building B roof, and one area of deteriorated roof decking. The area of deteriorated decking, where access is restricted, is indicated on EE/CA Figure 2.3.2.1.c.

Building C

Building C was constructed in 1958 as a production building and is one of the original three facility buildings. The building is 200-ft by 130-ft and two stories high. The majority of the building is production space that is open from floor slab to roof. A small portion contains a second floor mezzanine. This area was also previously used for storage of depleted uranium penetrators. Building C was the main production center for the facility from 1958 until construction of Building D in 1978. Building C contained the foundry, fabrication shop, machine shop, carpentry shop, and welding area, as well as the shipping and receiving area. Depleted uranium extrusion activities also took place in Building C. The fabrication shop also originally included a pickling tank and a caustic tank.

One specific item of note in Building C is the concrete pit located beneath the 1,400-ton extrusion press. This pit contains an estimated 10,000 gallons of liquid, assumed to be contaminated water resulting from infiltration through roof leaks. It is not known whether the contents of this pit are leaking into the sub slab and potentially the groundwater. Since it is made of a porous substance, however, there is a risk that some contamination is or could be released from the pit to the environment.

Most of Building C is currently designated a Radiation Work Area based on past production activities and current measurable levels of contamination. In a Radiation Work Area, only trained and monitored personnel are allowed, and proper personal protective equipment, i.e., safety glasses, rubber booties, and coveralls, is required under Starmet's MADPH-RCP license. Trained Radiation Workers employed by the Starmet Parties have access to all areas of Building C. However, currently only three areas of this building are utilized. The three areas are the rotating electroplasma machine area, the machine shop, and the northern end of the second floor mezzanine. The rotating electroplasma machine area which is also currently being used to store off-specification metal powders was cleared as a non-radiation work area; therefore, all workers have access to this particular area of Building C. The current operator continues to use the machine shop to support the beryllium operation.

The *Roof Evaluation* found a variety of leaks in the Building C roof, and one area of deteriorated roof decking. When water leaks through the roof, it comes into contact with lighting and other electrical equipment within Building C. The area of deteriorated decking, where access is restricted, is indicated on EE/CA Figure 2.3.2.1.c.

Building D

Building D, constructed in 1978, is a 280-ft by 160-ft two-story production building. A small portion of Building D also contains office space. Building D was constructed to augment the production capacity of Building C. It consisted of a fabrication area (including uranium fabrication), computerized milling machines, a quality control section and an acid pickling area. Buildings C and D are separated by fire walls.

Except for the northern end of Building D, which is currently being used as the beryllium foundry/rotating electroplasma machine area, the building is vacant but accessible to radiation workers inside the facility, that is, the rest of Building D is considered to be a Radiation Work Area.

EPA has observed minor roof leaks outside the acid pickling area and in the northwest corner of Building D.

Building E

Building E was constructed in 1983 and occupied in January 1984 for the purpose of housing the radioactive waste processing operations, including a concrete plant, and an emergency generator and associated 250-gallon fuel tank. Building E contains two 2,000-gallon tanks for holding sulfuric acid (5% solution), as well as two 55-gallon sulfuric acid (93% solution) day tanks. The

building also contains locker rooms and bathroom facilities. The footprint of the building has a main section of 200-ft by 150-ft, with a smaller 120-ft by 70-ft section on the south side. When sludge discharge to the holding basin was discontinued in 1985, wastewater was routed back to an evaporator (called the "sonodyne") in Building E from the tank house. Building E was constructed over an area originally used for materials and waste storage. The former site storage area was originally fenced in and was used for storing depleted uranium, copper, beryllium, machine oils, coolants, and solvents. The area also contained contaminated asphalt, concrete, soil, trees, and underground piping that had to be removed, decontaminated, or stored for later use. A storage building (Building B3), used for depleted uranium waste processing, and a flammable liquids shed were also moved before Building E was constructed. During the clearing of the area for Building E, underground pipes, manholes, and catch basins, some up to 20-feet deep, were removed.

Building E also contains the former research and development area known as the Hydrofluoric Acid Area and above ground storage tanks that contain used machining coolant and low pH wastewater contaminated with depleted uranium. The contents in the above ground storage tanks are being removed as part of EPA's second time-critical removal action.

The Starmet Parties currently operate the sonodyne machine located in Building E to treat wash water as well as rainwater runoff and rainwater that enters the buildings through leaks in the roof. Runoff from the roofs and rainwater that enters the building currently must be treated by the sonodyne machine because rainwater comes into contact with radioactive contamination on the roofs and other surfaces. In addition to the sonodyne area, the current operators also use the loading/receiving area to store beryllium waste prior to off-site shipment. Aside from the sonodyne and beryllium storage area, all other areas of the building, while vacant, are accessible to radiation workers and considered Radiation Work Areas.

EPA has reported observing minor roof leaks in and around the loading dock area.

Butler Buildings

There are four pre-engineered insulated metal buildings used for various support purposes on the Site. Referenced as the "Butler Buildings," numbered in the EE/CA as B1, B2, B3, and B4, these buildings occupy footprints of 2,048, 2,048, 2,400, and 4,800 square feet, respectively. These structures are all slab on grade.

Butler B1

Building B1 is a metal 'Butler' building that was part of the original facility construction in 1958. Building B1 was historically used for storage, as well as shipping and receiving. An environmental assessment completed in 1997 by Oak Ridge National Laboratory, under contract to the NRC, indicated that Building B1 was used for storage of depleted uranium. Butler B1 is currently a fabrication/maintenance shop.

Butler B2

Building B2 is a metal 'Butler' building that was part of the original facility construction in 1958. It was historically used for storage, as well as shipping and receiving. An environmental assessment completed in 1997 by Oak Ridge National Laboratory, under contract to the NRC, indicated that Building B2 was used for storage of depleted uranium. Butler B2 is currently used for shipping and receiving.

Butler B3

Building B3 is a metal 'Butler' building originally built in 1976. It was constructed as a separate waste handling facility. Depleted uranium wastes were processed for disposal both inside and outside of the building. This building was moved from its original location in 1983 for the construction of Building E. The metal walls were washed and painted and the building was relocated to its present position just east of Building C. It is currently being used to store uranium contaminated equipment received in the middle to late 1980s from American Lead, a former manufacturer of depleted uranium penetrators located in Colonie, New York.

Butler B4

Building B4 was constructed in 1977 as a loading dock area. Most of Building B4 has been used as a stock room. An environmental assessment completed in 1997 by Oak Ridge National Laboratory stated that approximately 200-gallons of 93% sulfuric acid (4 drums) had been staged in Building B4. Butler B4 currently is used to store lab coats and Beralcast molds. It is also the location where the Beralcast molds are produced. The portion of Butler B4 where the Beralcast molds are produced is a respiratory protection area due to the silica products used during production.

Tank House

The tank house was constructed in 1958 to serve as the collection, distribution, and treatment point for radioactive liquid acid wastes generated during the handling and production of depleted uranium stock and other specialty metals. The tank house is a 1,200 square foot, two level wooden framed structure built on a concrete slab located adjacent to the holding basin. Liquid wastes flowed to the tank house, were neutralized though the addition of lime, and then discharged to the holding basin. The structure is comprised of an upper (ground surface) level and lower (below ground surface) level. The upper level was used for storage of the neutralized material, e.g., lime, soda ash, with the lower level occupied by two 4,000-gallon above ground storage tanks. The storage tanks are currently being used to store wash water, prior to it being

treated by the sonodyne. Radiologically-contaminated sludge is present in the bottom of each tank. It is estimated that each tank contains 5,000 pounds of sludge.

Hydrogen Peroxide Tank House

Located northeast of Butler Building B3, the hydrogen peroxide tank house is a 15-ft X 12-ft wooden framed structure constructed within a 6-inck thick, six-foot high, concrete secondary containment structure. This building houses a 5,000-gallon lined above ground storage tank that was used to store 49% hydrogen peroxide (H_2O_2) (stabilized). The hydrogen peroxide was used in two processes: as an oxidizer in water treatment prior to neutralization/evaporation; and as an oxidizer for the closed loop pickling (where copper clad bars of depleted uranium were pickled chemically to remove the copper from the uranium). The volume of hydrogen peroxide currently stored at this time is unknown. This structure was reported to have been built around the time Building E (1983) was constructed.

Gas Cylinder Storage Sheds

Located directly west of Butler Building B2 are two gas cylinder storage sheds installed in 1983-1984. A six-foot high chain-link fence surrounds the sheds. The sheds measure 8-ft x 20-ft and appear to be constructed of fabricated steel "sealand" containers with ventilation openings throughout the exterior walls. The materials inside the sheds are being addressed under EPA's time-critical removal action.

Although the material within the sheds is being addressed under EPA's time-critical removal action, the sheds themselves could be accessible to trespassers as they are not within the main fenced area containing the other facility buildings.

Underground Storage Tank Area

Fuel oil for the Site is stored and dispensed from two 10,000-gallon underground storage tanks (USTs) located in the courtyard area between Buildings A and C, to the north of Building B .The fuel oil is used in the facility boilers that are located in Building B. Information regarding the installation date of the current tanks was not discovered during the Remedial Investigation scoping process. According to Starmet, the only fuel used currently and historically at the Site is No. 4 Heating Oil. A tank tightness test provided in a previous environmental study from the late 1990s identifies the product as No. 4 fuel oil. A review of on-site records, conducted by *de maximis* in March 2004, did not indicate the presence of other USTs on the Site.

4. Release or threatened release into the environment of a hazardous substance or pollutant or contaminant

The facility buildings at the Site are contaminated with depleted uranium and other hazardous substances. Depleted uranium contamination is found on the building roof-tops. Rainwater that comes into contact with the roof is currently treated. Inside the buildings, contamination is found on floors, walls, heavy equipment and machinery. Large cracks in the building's foundation likely provide a conduit for contamination within the facility to reach the subsurface soils under the foundation. The facility buildings are dilapidated, with leaking roofs in many places. The Starmet Parties are expected to vacate the Site in the near future. There is a release or threatened release of hazardous substances into the environment posed by the contamination on the roofs, the cracks in the building foundation, as well as the potential for fire, building collapse or vandalism at the Site.

Radiological Criteria

Two types of radiological criteria are established for this NTCRA: 1) criteria to determine unacceptable risk; and 2) criteria to determine acceptable on-site or off-site disposal alternatives or re-use, also termed "release criteria."

Unacceptable risk is determined by establishing an unacceptable level of radioactive contamination in units of radioactivity, then comparing measurements of radioactive contamination within the buildings to that criterion. Exceedance of the risk criteria would then necessitate removal of either the contamination or the materials containing that contamination to reduce the risk to acceptable levels. Release criteria for uranium are available from several sources, many of which provide the same values. A further discussion of the release criteria is provided below.

The Commonwealth of Massachusetts is an agreement state with the NRC and has promulgated regulations for the use of radioactive materials. In the Massachusetts Regulations for Control of Radiation (105 CMR 120.245), the license termination unrestricted release criterion is set at 10 millirem per year. At 10 millirem per year, this dose is equal to 40 dpm/100 cm^2 for U-238 for removable contamination.

In addition, EPA has established a calculation tool for building preliminary remediation goals (PRGs) for radionuclides: http://epa-bprg.ornl.gov/. This establishes criteria for remediation of buildings that comply with a risk-based standard such as the 10^{-4} to 10^{-6} NCP risk range. Using default parameters provided in the calculator, the PRG for U-238 is 14 dpm/100 cm^2 at a 10^{-6} risk, which equates to 1,400 dpm/100 cm^2 at a 10^{-4} risk. Comparing the PRG to the Commonwealth's unrestricted release criterion of 40 dpm/100 cm^2 U-238 equates to a 3×10^{-6} excess cancer risk, which is within EPA's risk range.

Considering the criteria with default parameters for dose and risk, the cleanup criterion of 10 millirem per year that meets the Commonwealth of Massachusetts regulations provides confidence that both dose and risk criteria would be satisfied. Site-specific parameters could be developed and used to derive site-specific values for the buildings; however, such calculations

would require knowledge of future use parameters for each area of the buildings. Therefore, for this NTCRA, the criterion of 40 dpm/100 cm^2 (10 millirem/year TEDE) will be the basis to evaluate unacceptable risk associated with radionuclides for future re-use. However, the use of the MADPH-RCP 10 millirem/yr unrestricted release standard relating to decommissioning for the NTCRA does not presuppose the land use assumptions for future actions at the Site.

Release Criteria

DOE Order 5400.5 ``Radiation Protection of the Public and the Environment" establishes standards and requirements for unrestricted release of equipment or materials from DOE sites that contain residual radioactive material as non-radiologically contaminated materials that can be either disposed or reused on site or removed from a site and disposed without radiological controls. These standards and requirements are similar to those used by NRC and the Army Corps of Engineers to release equipment or material from a site that is licensed to possess radioactive material. DOE Order 5400.5 states that the goal for exposure to a general member of the public should be less than 25 millirem per year with a goal of a few millirem per year for disposal at a on-site landfill. For on-site disposal, MADPH policy is that the disposal will not result in greater than 1 millirem per year exposure to the general public. MADPH interprets DOE Order 5400.5 to be consistent with MADPH agreement-state policy (see Administrative Record for MADPH position on this issue). All of these goals will be considered in evaluating on-site disposal or reuse options. For off-site disposal, the accepting facilities' waste acceptance criteria and state regulatory requirements will determine whether material may be disposed of at the subject landfill. Both the radiological and release criteria can be readily applied to survey data generated as discussed below.

Radiological and Building Surveys

The purpose of the building survey process was to inventory process equipment, furniture, waste, and hazardous materials. The radiological survey consisted of monitoring every available room, all open areas, and the roof to assess the levels of contamination and radiation exposure rates. The beryllium process areas were not included in the survey. Although the beryllium process areas were not directly surveyed, the volumes of equipment and material in these areas were estimated based on observation through windows and discussion with Starmet personnel.

Two types of radiological surveys were performed. The first was a general area dose rate survey using direct reading portable instruments; the second was to measure the fixed and removable contamination levels by taking direct readings and then collecting representative swipe samples of the buildings structures, i.e., floors, walls, equipment, and then analyzing them on-site with a radiation meter. General area dose rate surveys were performed using a microrem survey meter, fixed contamination levels were measured using a 100 cm^2 alpha and beta scintillator detector, and removable contamination was measured on wipes in an alpha and beta scintillator detector specifically designed for their analysis. The instruments were properly calibrated and response

checked prior to use to verify that they were operating properly. Calibration, operation and use were in accordance with the procedures presented in the RI/FS Health and Safety Plan.

Uranium emits alpha, beta and gamma radiation, and all three were evaluated as part of the radiological surveys. Dose rates measured gamma radiation levels, while the contamination surveys evaluated alpha and beta levels. General area dose rates provide an indication of how much radiation exposure an individual could receive from being in the building or area. Annual direct radiation exposure to someone working in these buildings can be estimated by multiplying the exposure rate by 2,000 hours (40 hours a week for 50 weeks). For example, an individual could be exposed to 10 millirem per year from direct exposure only if the general area dose rate is 5 microrem per hour. Conversely, 100 microrem per hour would result in an estimated exposure of 200 millirem per year.

In the following section, survey results are described and evaluated for each building, as well as for materials and equipment. For this evaluation, fixed contamination levels on the buildings were compared to the residual surface contamination criterion of 40 dpm/100 cm^2 (10 millirem per year). Most results showed levels much greater than this criterion, often by several orders of magnitude The levels shown on the figures range from less than 100 times the criterion (i.e., 4,000 dpm/100 cm^2) to greater than 100,000 times the criterion (i.e., 4,000,000 dpm/100 cm^2). See Figures 2.3.2.1a, 2.3.2.1b, and 2.3.2.1c and Table 2-1 for a summary of radiological building survey results. Figures 2.3.3.2a and 2b show areas of non-radiological impacts on the first and second floors of the facility buildings, respectively.

Building A

The majority of Building A has contamination up to 100 times the screening value. There are several areas, however, with more elevated surface contamination levels. On the first floor this includes the lobby, shop area, offices, hallway and laboratories. In general, these areas had surface contamination on the floor ranging from 4,000 to 30,000 dpm/100 cm^2 with minimal levels of removable contamination. General area dose rates in the first floor of Building A were in the 10 to 15 microrem per hour range.

Areas with elevated surface contamination levels on the second floor include some office areas, former machine shops, and laboratories. The second floor is similar to the first floor in contamination levels. Most elevated levels on the floor are also in the range of 4,000 to 30,000 dpm/100 cm^2, with minimal levels of removable contamination. One laboratory, however, has some areas with contamination levels near 375,000 dpm/100 cm^2, which is more than ten times the levels found anywhere else in the building. General area dose rates on the second floor of Building A were also in the 10 to 15 microrem per hour range.

The roof of Building A has many stacks and filter banks that are potentially contaminated with uranium. Surveys of the roof and ventilation systems found fixed contamination levels up to 30,000 dpm/100 cm^2. Some portions of the roof are not suitable to walk on, and these areas were not investigated.

Building B

Building B is very similar to Building A with respect to surface contamination. Elevated levels were identified in the elevator, a computer network area, and the men's rooms on both floors. Elevated levels in Building B were generally less than 30,000 dpm/100 cm^2 with minimal levels of removable contamination. General area dose rates in Building B were in the 10 to 15 microrem per hour range.

There are some areas of elevated contamination on the roof of Building B, mostly in and around an area that formerly had a large filter bank. Most of the south end of the Building B roof was not safe to walk on, and this area was not investigated.

Building C

Building C is the oldest of the manufacturing and production areas. It, therefore, has more significant surface contamination levels than Buildings A and B. There are, however, a few areas in Building C with contamination levels comparable to the general levels in Buildings A and B. These areas include hallways, machine shop office and support areas and an area that connects Building C to Building E. The rest of Building C has fixed contamination levels in the range of 100,000 to 500,000 dpm/100 cm^2, and removable contamination levels in the 1,000 to 3,000 dpm/100 cm^2 range. General area dose rates in Building C were in the 10 to 30 microrem per hour range.

Part of Building C has a second floor. The contamination levels are similar to those on the first floor. Starmet attempted to decontaminate a portion of the second floor; therefore, the area has lower surface contamination levels than the rest, approximately 10,000 dpm/100 cm^2. The main portion of this area has surface contamination levels predominately in the 30,000 to 100,000 dpm/100 cm^2 range. Removable contamination in this portion of the building also is limited.

The roof of Building C has numerous ventilation system components that are contaminated in addition to portions of the roof itself. Surveys of the roof found fixed contamination levels up to 30,000 dpm/100 cm^2.

Building D

Building D has comparable contamination levels to Building C. Most of Building D has areas greater than 300,000 dpm/100 cm^2 with numerous hot spots in excess of 1,000,000 dpm/100 cm^2. The foundry area has the highest contamination levels identified during these characterization surveys, with fixed contamination levels just shy of 5,000,000 dpm/100 cm^2. Removable contamination levels are similar to Building C in the 1,000 to 3,000 dpm/100 cm^2 range. General area dose rates in Building D were elevated as well, with areas in the 120 to 140 microrem per hour range.

There are several offices in the small second floor of Building D. Contamination levels were in the 10,000 to 20,000 dpm/100 cm^2 range with almost no removable contamination.

The roof of Building D has a significant number of contaminated ventilation system vents and filter housings. There are numerous areas of elevated fixed contamination levels around these ventilation system components, with one having levels greater than 100,000 dpm/100 cm^2.

Building E

Building E has similar contamination levels to Buildings C and D. The quality control holding area, adjacent hallways and janitor's closet have the highest contamination levels in the 60,000 to 900,000 dpm/100 cm^2 range. Removable contamination levels are similar to those found in Buildings C and D, in the 1,000 to 3,000 dpm/100 cm^2 range. The waste processing area, hydrofluoric acid area and quality control and surrounding areas have the next highest degree of contamination, in the 6,000 to 35,000 dpm/100 cm^2 range. The locker rooms, change area and several other small offices and areas in Building E are generally less than 4,000 dpm/100 cm^2. General area dose rates in Building E were also elevated, with areas in the 80 to 100 microrem per hour range.

Some portions of Building E have a second floor, and these areas range from 4,000 to 30,000 dpm/100 cm^2. A hallway over the Quality Control area has some elevated spots on the floor that range from 60,000 to 90,000 dpm/100 cm^2.

The roof of Building E also has some ventilation system vents where contamination levels were lower than on other portions of the building roof. The levels were generally in the 4,000 to 10,000 dpm/100 cm^2 range.

Miscellaneous Structures

Contamination levels in the remaining buildings and sheds ranged from near background to 300,000 dpm/100 cm^2. Butler Building B-3 has the highest contamination levels of these miscellaneous structures, with portions of the building at 300,000 dpm/100 cm^2. Butler buildings B-1 and B-4 have contamination levels up to 30,000 dpm/100 cm^2, mostly on the floor. The tank house and hydrogen peroxide tank house have contamination levels in the range of 4,000 to 10,000 dpm/100 cm^2. The rest of the miscellaneous structures have limited contamination, generally less than 4,000 dpm/100 cm^2.

Materials and Equipment

Throughout all the buildings there are various tools, equipment and furniture, all of which are contaminated. In Buildings A and B, contaminated equipment was identified in some of the offices, as well as in the laboratories and wax mold production areas. For example, an office chair was identified with 18,000 dpm/100 cm^2. In Buildings C, D and E, equipment and tools associated with the uranium manufacturing and production process have contamination levels at very high levels, many exceeding 1,000,000 dpm/100 cm^2. The Butler buildings and tank house also have contaminated equipment, most of it less than 150,000 dpm/100 cm^2.

Other Hazardous Substances

A large quantity of PCB-containing ballasts and transformers are located within the facility buildings. PCBs have also been detected in media outside of the buildings in areas where floor drains are known to have discharged. The presence of PCB containing materials within the buildings, and significant concentrations at drain discharges suggests that the buildings also contain PCBs. Although for the purposes of the EE/CA, the buildings were only sampled for radioactive contamination, it is likely that the buildings contain significant levels of not only depleted uranium and PCBs, but also copper, beryllium, asbestos and other hazardous substances. For example, the process of producing depleted uranium bullets required the use of copper and nitric acid, among other hazardous materials, thereby making it likely that the buildings are contaminated with these substances. Asbestos floor tiles are located throughout the facility as indicated by Starmet's historical waste profiles for shipment of radioactively-contaminated floor tiles to a low-level radioactive waste facility. In addition, a time-critical removal action is currently being conducted to remove hazardous and flammable materials from within the facility buildings. Some of the materials removed by EPA included but are not limed to: hydrofluoric acid, nitric acid, sulfuric acid, hydrochloric acid, hydrogen peroxide, acetone, and copper powder. A more extensive characterization of the hazardous materials present within the facility buildings will be conducted prior to demolition.

5. NPL status

This Site is listed on the National Priorities List (NPL). The Site was proposed for listing on the NPL on July 27, 2000, and was listed on the NPL on June 14, 2001.

B. Other Actions to Date

1. EPA Region 1 Emergency Planning and Response Branch (EPRB) Actions

EPA's EPRB has been involved at the Site since mid-2000. Through investigations of past activities and EPRB subsequent Preliminary Assessment/Site Investigations (PA/SIs), two discrete buried drum areas were identified: one was located between the holding basin and the water cooling recharge pond, and one is located within the old landfill area immediately south of the sphagnum bog. (See map attached as Figure 2.1.3, showing the locations of the cooling water recharge pond, holding basin, and sphagnum bog.)

From April 23, 2002 to April 30, 2003, the EPRB conducted a time-critical removal action that included the installation of a cap over the old landfill area, and the installation of a liner over the holding basin. In addition a fence was erected around the old landfill area. A small buried drum area located within a fenced area near the holding basin was not addressed as part of this removal action because trespasser access to the buried materials was limited and the materials were not at or near the surface. As explained below, the buried materials were removed from the Site in December 2004. The 2002 removal action prevented the direct contact threat with the contaminated surface soils located in the landfill area, eliminated contaminated dust migration

from the holding basin, and prevented precipitation from infiltrating the soils within the holding basin.

Due to a fire that occurred at the Site in June 2007, EPA's EPRB began a second time-critical removal action in early 2008 to remove hazardous and flammable materials from within the facility buildings at the request of the Concord Fire Department. The expected completion date is fall 2008.

2. Remedial Branch Actions

In 2003, EPA entered into an Administrative Order by Consent to perform a Remedial Investigation / Feasibility Study (Consent Order) with several potentially responsible parties for the Site. The Respondents under the Consent Order are performing the RI/FS at the Site, which is now entering the final stages of the remedial investigation. The drums discovered during the 2002 time-critical removal action were removed in December 2004 as part of the activities performed under the Consent Order. In addition, as another activity performed under the Consent Order, the Respondents performed an EE/CA which evaluated alternatives for addressing buildings on the Site. As set forth more fully above, studies performed to date indicate that significant portions of the Site buildings are contaminated with depleted uranium and other hazardous substances.

C. State and Local Authorities' Roles

1. State and local actions to date

From about the late 1980's to 2000, Starmet, performed certain Site investigations and a partial cleanup under the oversight of MADEP. In 1997, Starmet, with the financial support of the U.S. Army, and oversight by MADEP and MADPH-RCP, excavated approximately 8,000 cubic yards of soil contaminated with depleted uranium and copper from the on-site holding basin and disposed of these soils at an off-site, low-level radioactive waste disposal facility. The cleanup halted in late 1998 when Starmet determined that the cleanup level required by MADEP could not be met without excavating significantly more material.

In the spring of 2006, MADEP conducted a removal action, with proceeds obtained by the State through a settlement with the U.S. Army, which consisted of the removal of more than 3,800 drums and containers containing depleted uranium from within the facility.

On May 22, 2007, MADPH-RCP and Starmet entered into a Consent Decree in which Starmet agreed to vacate the Site by October 31, 2007. Starmet's related companies (i.e., the Starmet Parties), also operating at the Site, were required to vacate the Site on the same date. Starmet has not left the Site to date; however, it is in discussions with MADPH-RCP and EPA regarding its departure. Starmet is currently providing security for the Site, including on-site security guards and maintenance of heat, electricity, fire alarms, sprinkler, and water treatment systems. Starmet's provision of security will terminate after it vacates the Site.

On June 26, 2007, the Concord Fire Department, MADPH-RCP, MADEP, and EPA responded to a fire at the Starmet facility. Subsequently, the Concord Fire Department issued two orders to Starmet to correct various violations of the state fire code at the Site. The most recent order of notice to Starmet issued on October 4, 2007, required Starmet to "provide a plan for the proper storage of all combustible and flammable materials currently on-site." On November 14, 2007, the Concord Fire Department met with Starmet representatives to review the status of compliance with the order of notice, and concluded that Starmet had not met the conditions of the order. On November 21, 2007, the Concord Fire Department sent a letter to EPA requesting assistance with removing these materials from the Starmet facility, concluding that the continued existence of these materials within the facility constitutes an imminent threat to public health and safety. EPA began a time-critical removal action in early 2008 to remove hazardous and flammable materials from within the facility buildings. The expected completion date is fall 2008.

2. Potential for continued State/local response

The Concord Fire Department, MADEP, and MADPH-RCP will continue to be involved with the Site, with MADEP as the lead for the state. With the exception of an approximately $700,000 letter of credit obtained from Starmet's financial assurance under their radioactive materials license, there are no state response mechanisms available with sufficient funds to perform the NTCRA.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Based on Site conditions and information available on the hazardous substances present, the Site poses the following threats to public health, welfare, or the environment:

A. Threats to Public Health or Welfare or the Environment

"Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants" [300.415(b)(2)(i)];
The property is bordered by residential properties to the east, a commercial property to the west, Main Street (Route 62) to the north and to the south and southwest by conservation land/woodlands and the Thoreau Hills Summer Camp. High levels of uranium contamination have been found within deteriorating roof-top ventilation equipment and on the surfaces of the buildings and their contents. Contaminant migration during a fire, as a result of further deterioration of the roofs and other structural components of the buildings or through unauthorized or unintentional removal of contaminated materials could potentially expose nearby human populations, animals, or the food chain. In responding to another fire at the Site, firefighters may be exposed to various hazardous substance present in the buildings, including depleted uranium. In addition, if access to the buildings and their contents is not sufficiently restricted, this could result in exposure to the human population from hazardous substances, including radioactive waste, should trespassers come into contact with these materials or if these materials are intentionally or unintentionally removed from the Site. Animals (such as mice, rats,

raccoons and birds) that enter the buildings through small holes in the walls, roofs, and foundation also may come into contact with hazardous substances, including radiological waste, at the Site.

"Actual or potential contamination of drinking water supplies or sensitive *ecosystems" [*40 CFR 300.415(b)(2)(ii)]*:*
There is potential that releases from within the buildings to an existing network of drain lines or to sub-slab soils could potentially affect groundwater. It is likely that unsealed cracks in the facility floors and sumps have been pathways for migration of the contamination into the groundwater. Site groundwater is contaminated at levels exceeding MCLs. In addition, precipitation runoff from the highly contaminated roof ventilation systems could potentially further contaminate the groundwater

"Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release" [300.415(b)(2)(iii)];
Although the majority of the drums and containers of hazardous materials have been removed from the facility buildings, some equipment may contain unknown materials within, potentially causing a threat of release should the facility be subject to a serious fire. In addition, the tank house holds two 4,000 gallon tanks that contain depleted uranium sludge and wastewater, and the hydrogen peroxide tank house holds a 5,000 gallon tank that historically held 49% solution of hydrogen peroxide. The current volume of all these tanks is unknown, however should a fire or explosion occur at the facility, these materials could become airborne, inhaled or ingested by firefighters and residents living, walking, or playing in the surrounding residential areas.

"Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released" [300.415(b)(2)(v)];
Due to the deteriorating condition and leaks in the roofs of the facility buildings, the contamination on floors and walls of the facility buildings might be released to the environment through rainwater entering the buildings through these leaks, followed by contaminant migration through floor drains, cracks and sumps . Highly contaminated ventilation systems on the roofs that are continuing to degrade over time may also contribute to a release through roof drains and/or into the underlying soils or groundwater. In addition, once Starmet leaves the Site, it will no longer provide heat or electricity, to ensure that pipes do not freeze, and the snow on the roof does not accumulate to such a degree to cause roof failure.

"Threat of fire or explosion" [300.4159(b)(2)(vi)];
There is a threat of fire or explosion at the Site for several reasons. There are large volumes of combustible material (e.g. historical documents, ceiling tiles, wooden wall partitions, wooden pallets) that may ignite. Some equipment also is contaminated with depleted uranium sludge, which may become pyrophoric if it dries out. The dilapidated condition of the buildings also increases the potential for fire or explosion. The leaks in the roofs of the buildings threaten the buildings' electrical system, potentially compromising the functionality of the fire alarm and suppression systems, as well as potentially causing a fire through contact with live electrical wiring. The failure of the electrical system in the facility would increase the potential for fire. This is a significant risk at the Site, as exemplified by the fire that occurred on June 26, 2007.

"The availability of other appropriate federal or state response mechanisms to respond to the release" [300.415(b)(2)(vii)];
EPA is the lead agency at the Site. The Site was listed on the NPL on June 14, 2001. There are no state response mechanisms available with sufficient funding to respond to the release. The MADPH-RCP has limited funds available through accessing Starmet's letter of credit for decommissioning the facility, however, these monies will be used to provide funding for site security and other building maintenance measures, if necessary. Therefore, insufficient money is available to support this NTCRA from other federal or state response mechanisms.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances at or from the Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, and the environment.

V. EXEMPTION FROM STATUTORY LIMITS

This removal, if performed as a Fund-lead response, will require funding above $2 million and will require more than one year to implement, thereby exceeding the statutory money and time limits on Fund-financed removal actions established under Section §104(c) of CERCLA and Section 300.415(b)(5) of the NCP. The proposed NTCRA is projected to cost approximately $64 million and take 36-48 months to complete. However, a "consistency" exemption is invoked through this Action Memorandum to allow for the proposed removal action to exceed the $2 million ceiling and the 12 month limit for Fund-financed removal actions.

CERCLA §104(c) states that removal actions can exceed the $2 million and 12 month statutory limits if conditions meet either the "emergency exemption" criteria or the "consistency exemption" criteria. The consistency exemption requires that the proposed removal be appropriate and consistent with the remedial action to be taken. As described below conditions and proposed actions at the Site meet the criteria for a consistency exemption.

A. Appropriateness

EPA OSWER directive 9360.0-12A, "Final Guidance on Implementation of the "Consistency" Exemption to the Statutory Limits on Removal Actions," June 12, 1989, states that an action is appropriate if the activity is necessary for any *one* of the following reasons:

1. To avoid a foreseeable threat;
2. To prevent further migration of contaminants;

3. To use alternatives to land disposal, or,
4. To comply with the off-site policy.

The NTCRA described in Section VI below meets criteria one and two identified above. The proposed removal action permanently abates the foreseeable threat posed by the facility buildings and their contents. In addition, by addressing the facility buildings at this time, the removal action will minimize the scope of the final remedial action and the potential for migration of contaminants from the facility buildings.

The proposed removal action is therefore appropriate and necessary.

B. Consistent With the Remedial Action

The proposed NTCRA is also consistent with anticipated remedial actions to minimize exposure to and migration of contaminants. As indicated in EPA's 1989 guidance (p. 3), "the 'remedial action to be taken' is the remedial action that, prior to the start of the removal action, was planned or could reasonably have been expected to be taken." At this Site, in order to obtain the MADPH-RCP decommissioning requirements (10 millirem/yr TEDE) under 105 CMR 120.245, the facility buildings would eventually have to be demolished due to the high levels of contamination found on and in the buildings. Demolition will also be required due the deteriorating condition of the buildings and the potential for collapse of the buildings due to disrepair or fire. Because the performance of the demolition is part of the expected remedial action, the proposed NTCRA is consistent with the remedial action to be taken.

The proposed NTCRA is one part of a phased approach to address concerns at the Nuclear Metals Superfund Site. The other components are (1) a time-critical removal action conducted in 2002 including: installation of a permanent fence around an area containing buried drums where local residents and a summer camp had direct access; capping of beryllium-contaminated soils overlying the same buried drum area; and lining of the holding basin with a temporary cover; (2) a MADEP removal action that has addressed the 3,800 stored drums and containers of depleted uranium in the facility through an agreement reached with the U.S. Army; (3) a time-critical removal action currently being conducted to remove containers of flammable and other hazardous substances from the Site that constitute a threat of fire and/or explosion; and (4) the phased RI/FS which will fully characterize the Site, followed by implementation of the selected remedy.

Because the proposed NTCRA is both appropriate and consistent with the remedial action to be taken, EPA finds that the requirements of the consistency exemption under Section 104(c) of CERCLA have been met.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Action

The proposed action for this NTCRA is to demolish the facility buildings down to slab with on-site or off-site disposal. This alternative is EPA's preferred alternative; it entails the following work:

- Remove and dispose of asbestos throughout the buildings; remove and dispose of computer equipment, transformers, mercury switches, fluorescent light bulbs, etc.;
- Remove and dispose of building contents and debris;
- Interior cleaning to control dusts;
- Conduct a comprehensive radiological survey of facility building shell to refine costs associated with future building demolition and off-site disposal;
- Strip off removable radiological contamination from building materials to minimize waste volumes;
- Cap and/or clean existing drain lines, vaults, and sumps;
- Demolish buildings down to their slab foundation;
- Off-site disposal of majority of material at an appropriately-licensed facility;
- Potential on-site disposal and/or beneficial reuse of non-contaminated building debris;
- Fill voids and temporarily cap building slabs, pending future remedial actions to address building slabs, sub-soils, and contaminated plumbing and/or drain lines.

1. Removal Action Objectives

Based on the conditions described above, contamination within and on the buildings and their contents presents a significant risk that should be addressed while long-term remedial options for the Site are evaluated.

The following Removal Action Objectives have been developed with respect to disposition of the buildings and their contents. The Removal Action Objectives were developed in consideration of the potential human health and ecological risks associated with exposure to these media. They are designed to meet the MADPH-RCP unrestricted release clean up standard of 10 millirem/year TEDE pursuant to 105 CMR 120.245.

Prevent Release to the Environment

Prevent the release of radionuclides and other hazardous substances from drums, barrels, tanks, other bulk storage containers, or contaminated surfaces, including roofs, equipment or building materials that present an unacceptable risk to human health and the environment.

Prevent Direct Exposure to Radionuclides and Other Contaminants

Prevent direct contact with, ingestion of, inhalation of, and external exposure (radiological) to contaminants present within and on the buildings and their contents that present an unacceptable risk to human health and the environment.

Contribute to the Efficient Performance of Remedial Activities

To the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned.

2. Proposed action description

The alternatives that were subject to detailed analysis are the following:

Removal Action Alternatives:

Alternative 1: No Action - building and contents remain in place, and no response measures would take place.

Alternative 2: Limited Action -- Monitoring and Access Controls: ("Access Control")
• Monthly site inspections of interior and exterior of buildings to document changes in conditions of buildings and/or potential releases of material from buildings, as well as to monitor evidence of trespassing, if any;
• Terminate existing building utilities and install temporary electrical/heating to support inspections, fire alarm system and fire suppression system;
• Limit site access by fencing property;
• Posting signs and placards around the property, and provision of a 24-hour security guard.

Alternative 3: Building Stabilization, Removal of Flammable and Hazardous Substances, Limited Demolition and Off-site Disposal ("Stabilization")
This alternative includes all of the work under alternative 2 in addition to the following:
• Stabilization of building roofs to provide a safe working environment;
• Remove and dispose of remaining hazardous, flammable and combustible materials within facility buildings;
• Remove and dispose of fluids within equipment, including fuels, oils, hydraulic fluids, and antifreeze/coolant;
• Demolish and dispose off-site of a limited number of significantly contaminated buildings and equipment;
• Sub-slab soil investigation to support the ongoing Remedial Investigation/Feasibility Study

Alternative 4: Building Stabilization, Removal of Building Contents and Off-site Disposal ("Stabilization/Building Content Removal")
This alternative includes all of the work under alternative 3 in addition to the following:
• Remove and dispose of asbestos throughout the buildings; remove and dispose of computer equipment, transformers, mercury switches, fluorescent light bulbs, etc.;
• Remove and dispose of building contents and debris leaving only building shell intact, including: non-structural support walls, floor covering, interior ductwork, ventilation equipment, process machinery, and conduit and utility piping;
• Interior cleaning to control dusts
• Conduct a comprehensive radiological survey of facility building shell to refine costs associated with future building demolition and off-site disposal.

Alternative 5: Demolition of Buildings Down to Slab with On-site or Off-site Disposal ("Demolition")

This alternative is EPA's preferred alternative; it includes all of the work under alternative 4 in addition to the following:

- Strip off removable radiological contamination from building materials to minimize waste volumes;
- Cap and/or clean existing drain lines, vaults, and sumps;
- Demolish buildings down to their slab foundation;
- Off-site disposal of majority of material at an appropriately-licensed facility;
- Potential on-site disposal and/or beneficial reuse of non-contaminated building debris;
- Fill voids and temporarily cap building slabs, pending future remedial actions to address building slabs, sub-soils, and contaminated plumbing and/or drain lines.

As required under CERCLA and the NCP, during the EE/CA process, all of the alternatives were evaluated independently based upon cost, effectiveness, and implementability. Cost was used to assess options of similar effectiveness and implementability. Effectiveness was based upon the ability of the alternative to meet the removal action objectives. The effectiveness evaluation also involved the assessment of federal and state applicable or relevant and appropriate requirements (ARARs). Implementability involved the assessment of technical feasibility, availability, and administrative feasibility. After comparing these alternatives and weighing the strengths and weaknesses, EPA has selected Alternative 5 as presented below as the best balance of human health and environmental protection considering cost, effectiveness, and implementability of each of the alternatives. Immediately below is a comparison of the five alternatives based on effectiveness, implementability, and cost. See the EE/CA for a more detailed presentation of the cost and components of each alternative.

Effectiveness

Alternative 1 (No Action) is not effective, as it is not protective; nor does it address risk or meet Removal Action Objectives, since no action will be implemented.

Alternative 2 (Access Controls) is marginally effective, in that it is slightly more protective than "no action." It would not achieve all of the Removal Action Objectives. The provision of site access controls and security would reduce the potential for exposure to trespassers. However, the threat of release, risk of fire, and potential for further migration of contaminants would not be reduced by this alternative. Alternative 2 would slightly reduce risks to human health and the environment in the short-term, through reduction in the potential for exposure to trespassers and others in contact with the buildings and contents and reduction in the potential for removal of contaminated materials by unauthorized personnel.

Alternatives 3 (Stabilization) and 4 (Stabilization/Building Contents Removal) each provide additional protection beyond Alternatives 1 and 2. The threat of release due to a fire and/or

partial building collapse would be addressed by stabilization and removal of combustible materials during implementation of Alternative 3. Alternative 4 (Stabilization/Building Contents Removal) would result in the further reduction of risks and reduction in the need for Post Removal Site Control; Alternative 5 would eliminate these risks. Alternative 5 also would contribute most effectively to the anticipated remedial action. All active alternatives will require Post Removal Site Control.

Only Alternative 5 meets the 10 millirem/yr state unrestricted release criteria for license termination under 105 CMR 120.245.

Implementability

Technical Feasibility – All alternatives are technically feasible. Each of the "active" alternatives, i.e., Alternatives 3 (Stabilization) , 4 (Stabilization/Building Contents Removal) and 5 (Demolition), would contribute to the overall remedial performance, and would be consistent with the anticipated scope of a final remedy for the Site. Alternative 5 would implement the majority of the actions anticipated for the final Site remedy with respect to buildings and structures, leaving only the slabs and sub-slab soils for the likely final remedy to address. Alternatives 3 and 4 would also address substantive portions of the anticipated final remedy. Of the active alternatives, only Alternatives 3 could be completed within the one year statutory limit for removal actions, with Alternative 4 taking two and one-half years to complete, and Alternative 5 taking three years to complete.

Availability – Equipment, personnel, services, and outside laboratory capacity are available for all alternatives. The active alternatives will require increasing amounts of off-site disposal capacity, with Alternative 3 needing the least, and Alternative 5 the most. Facilities for off-site disposal are expected to be available. However, there are limited options available for the disposal of low level radioactive waste. This issue is discussed further in the sensitivity analysis in Section 6.4 of the EE/CA

Administrative feasibility – All alternatives are administratively feasible with respect to the need for permits, rights-of-way, easements, and lack of anticipated impacts to adjoining property. Alternatives 3, 4, and 5 would require exemptions from statutory limits, with Alternative 3 needing an exemption for cost, and Alternatives 4 and 5 requiring exemptions for both cost and duration.

Cost:

As discussed above in the effectiveness analysis, performance of Alternatives 2 (Access Control), 3 (Stabilization) or 4 (Stabilization/Building Contents Removal) each would achieve only part of the overall goals for the Site, leaving the remainder of the work for the final remedy. Alternative 2 would not significantly contribute to the final remedy, in that most of the costs of this alternative are for monitoring and security. Alternatives 3 and 4 would each result in significant removal of Site materials, and would reduce the cost of the final remedy by approximately the cost of the alternative. An analysis of these costs indicates that in the long term, the cost to demolish the buildings and take all contents off-site for disposal will be performed most

efficiently by Alternative 5, as this alternative eliminates costs that are either unnecessary or are redundant for the final remedy.

A summary of costs for each alternative is provided below:

ALTERNATIVE	TOTAL COST
Alternative 1 –No Action	$140,000
Alternative 2 –Limited Action – Monitoring and Access Controls	$3,274,000
Alternative 3 –Building Stabilization	$14,377,000
Alternative 4 –Building Stabilization and Building Contents Removal with Off-Site Disposal	$39,700,000
Alternative 5 –Building Stabilization, Building Contents Removal and Building Demolition with On-Site or Off-Site Disposal	$63,945,000

Alternative 5 is EPA's Preferred Alternative: Building Demolition with On-Site or Off-Site Disposal

Technical Description

The work to be conducted under Alternative 5 is discussed in detail in Section 5.5. of the EE/CA. This work includes removal of all building contents, followed by demolition and disposal of all buildings and contents. Removal of buildings would not include the removal of concrete slabs. Slabs and foundations would remain in-place so as not to disturb potentially-contaminated underlying soil. After removal of the buildings, sumps and depressions in the slab will be filled, and the concrete slabs will be overlain with a short-term cap or sealed until a future decision is made regarding the handling of underlying site soils.

Effectiveness

Protectiveness – This alternative would result in the greatest protection in that the risk from direct contact, from a release, or from exposure to the buildings and their contents would be virtually eliminated as hazardous substances on or in the facility buildings would be removed permanently from the Site. During the performance of this alternative, all short-term risks posed to the community, on-site workers or the environment would be fully addressed. Protectiveness of public health and the community would be provided by surveillance and implementation of engineering controls (such as dust suppression and ambient air monitoring) during removal action

activities. Protection of workers conducting removal action activities would include the use of engineering controls, personal protective equipment, worker and area air monitoring, and compliance with a site-specific health and safety plan.

Contaminated building slabs and sub-slab contamination, if any, would remain in place pending the selection and implementation of a final remedy. Until such time, this alternative will remove or fix in place, then temporarily cap in place contamination on the slabs to minimize the risk of further migration.

Ability to Achieve Removal Objectives – This alternative would most fully meet all of the removal action objectives. The threats of release and direct exposure would be best eliminated by removing contaminated materials and building materials for off-site disposal. Depending on the type and quantity of this material, some may be disposed or reused on-site, either temporarily or permanently, if not contaminated with hazardous or radioactive substances. Alternative 5 would most effectively contribute to the expected remedial action.

Ability to Achieve ARARs – This alternative would attain all ARARs including the 10 millirem/yr state unrestricted release criteria for license termination under 105 CMR 120.245.

Implementability

Technically feasibility – This alternative would be technically feasible. Implementing this work would constitute a significant step towards the final remedy for the Site. This work would take approximately three to four years to complete, more than the statutory one-year limit for Fund-financed removal actions.

Availability – Equipment, personnel, services and laboratory testing capacity are available to complete this alternative. Off-site treatment and disposal capacity is available; however, the costs for certain types of disposal are considered variable, and are discussed further in the sensitivity analysis regarding costs provided in Section 6.4 of the EE/CA. As stated above, on-site disposal and/or beneficial reuse for some building material may be considered if the material is not contaminated. Post Removal Site Control has been included in this alternative for the assumed time delay between completion of the alternative and implementation of a final remedy at the Site.

Administrative Feasibility – This alternative is considered administratively feasible, in that no permits will be required for on-site work, no easements or rights-of-way will be required, nor are impacts to adjoining properties considered likely. The cost of this alternative, however, exceeds the statutory limit of $2,000,000 for a Fund-financed removal action. As noted above, the duration of this alternative also exceeds the statutory time limit for a Fund-financed removal action. However, as provided above, the "consistency" exemption from the statutory limits has been satisfied. The technical scope of the removal action would be "appropriate and consistent with the remedial action to be taken" (as defined in the *Final Guidance on Implementation of the "Consistency" Exemption to the Statutory Limits on Removal Actions* (OSWER Directive 9360.0-12A, June 1989), as outlined above.

Cost

The cost estimate for Alternative 5 is $63,945,000, as detailed in the attached Table 4. See also Section 6.4 of the EE/CA for a cost-sensitivity analysis, given the likely variability/uncertainty of the costs associated with disposal. That is, depending on volume of material that needs to go to the highest priced facility for disposal, the cost differential for this NTCRA could be as much as $30 million.

3. Community relations

In advance of and during performance of this NTCRA, EPA's Community Involvement Office will disseminate information regarding the project to the impacted residents and local citizen groups. There are two very active community groups that EPA meets with bi-monthly to discuss technical issues at the Site, the town-appointed 2229 Main Street Advisory Committee and the Technical Assistance Grant recipient Group CREW (Citizens Research and Environmental Watch). EPA will continue to work closely with the Town, CREW, and state officials as the project progresses.

The Town of Concord, CREW, and the State fully support EPA's decision to demolish the buildings under this NTCRA. By letter dated September 11, 2008, MADEP indicated their support for the NTCRA (attached as Appendix D).

4. Contribution to remedial performance

Contribution to the Efficient Performance of Remedial Activities

Under Section 104(a)(2) of CERCLA and Section 300.415(d) of the NCP, removal activities shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned. See EPA's OSWER Directive 9360.0-13, "Guidance on Implementation of the 'Contribute to Remedial Performance" Provision." This provision was meant to avoid repetitive removal actions that do not take into account their impact on the performance of subsequent remedial actions and to allow for more permanent tasks to be completed under removal authorities. 53 Federal Register 51409-51410 (December 21, 1988). Together, Sections 104(a)(2) and 104(c) ("consistency" exemption) are intended to promote and enhance efficiency and continuity.

Section 104(a)(2) of CERCLA and Section 300.415(d) of the NCP require that any removal action should, to the extent deemed practicable, contribute to the efficient performance of any long term remedial action with respect to the release or threatened release concerned. This removal action will contribute to the efficient performance of any long term remedial action by eliminating the potential for further release of hazardous substances found on or in the facility buildings at the Site. As indicated above, in order to obtain the MADPH-RCP decommissioning requirements (10 millirem/yr TEDE) under 105 CMR 120.245, the facility buildings would

eventually have to be demolished due to the high levels of contamination found on and in the buildings. Demolition will also be required due the deteriorating condition of the buildings and the potential for collapse of the buildings due to disrepair or fire. Because the performance of the demolition is part of the expected remedial action, the proposed NTCRA contributes to the efficient performance of any long term remedial action.

5. Description of alternative technologies considered

A detailed description of alternative decontamination technologies is located in sections 5.6.1 and 5.6.2 of the EE/CA. The EE/CA stated that although there are numerous technologies available for the decontamination of the buildings, the contamination of the buildings is so extensive and the buildings are in such a state of disrepair that decontamination for the purposes of re-use is not an option. Moreover, it is unlikely that decontamination of the facility buildings would achieve the state's criterion of 10 millirem/yr and would more than likely be significantly more expensive than demolition because decontamination is labor-intensive and the various decontamination technologies would produce volumes of waste which would require disposal. A flow chart is provided in the EE/CA that outlines the decision-making process used to determine whether decontamination would be cost-effective.

6. Applicable or relevant and appropriate regulations (ARARs)

The ARARs tables are attached as Tables 3-1 and 3-2.

7. Project schedule

Duration of the removal action shall be between 36 and 48 months from the day of its commencement.

B. Estimated Costs

The PRP estimated costs associated with Alternative 5 are $63,945,000. A more detailed breakdown of costs associated with this alternative can be found in the attached Table 4.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

In the absence of the removal action described herein, conditions at the Site can be expected to remain unaddressed, and threats associated with the presence of the contaminated facility buildings and contaminated materials and equipment contained therein will continue to pose a threat of release.

VII. OUTSTANDING POLICY ISSUES

There have been no outstanding policy issues identified to date.

VIII. ENFORCEMENT

See attached Enforcement Strategy.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Nuclear Metals Superfund Site in Concord, MA, developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. The decision is based on documents contained in the Administrative Record for the Site.

Conditions at the Site meet the criteria set out in the NCP due to:

"Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants" [300.415(b)(2)(i)];

"Actual or potential contamination of drinking water supplies or sensitive ecosystems" [300.415(b)(2)(ii)];

"Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release" [300.415(b)(2)(iii)];

"Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released" [300.415(b)(2)(v)];

"Threat of fire or explosion" [300.415(b)(2)(vi)]; and

"The availability of other appropriate federal or state response mechanisms to respond to the release" [300.415(b)(2)(vii)].

I recommend that you approve the proposed removal action. Your signature will also reflect that an exemption pursuant to Section 104(c) of CERCLA and Section 300.415(b)(5)(ii) of the NCP has been granted.

APPROVAL: _____ DATE: 9/23/08

DISAPPROVAL: _____ DATE:

Figures

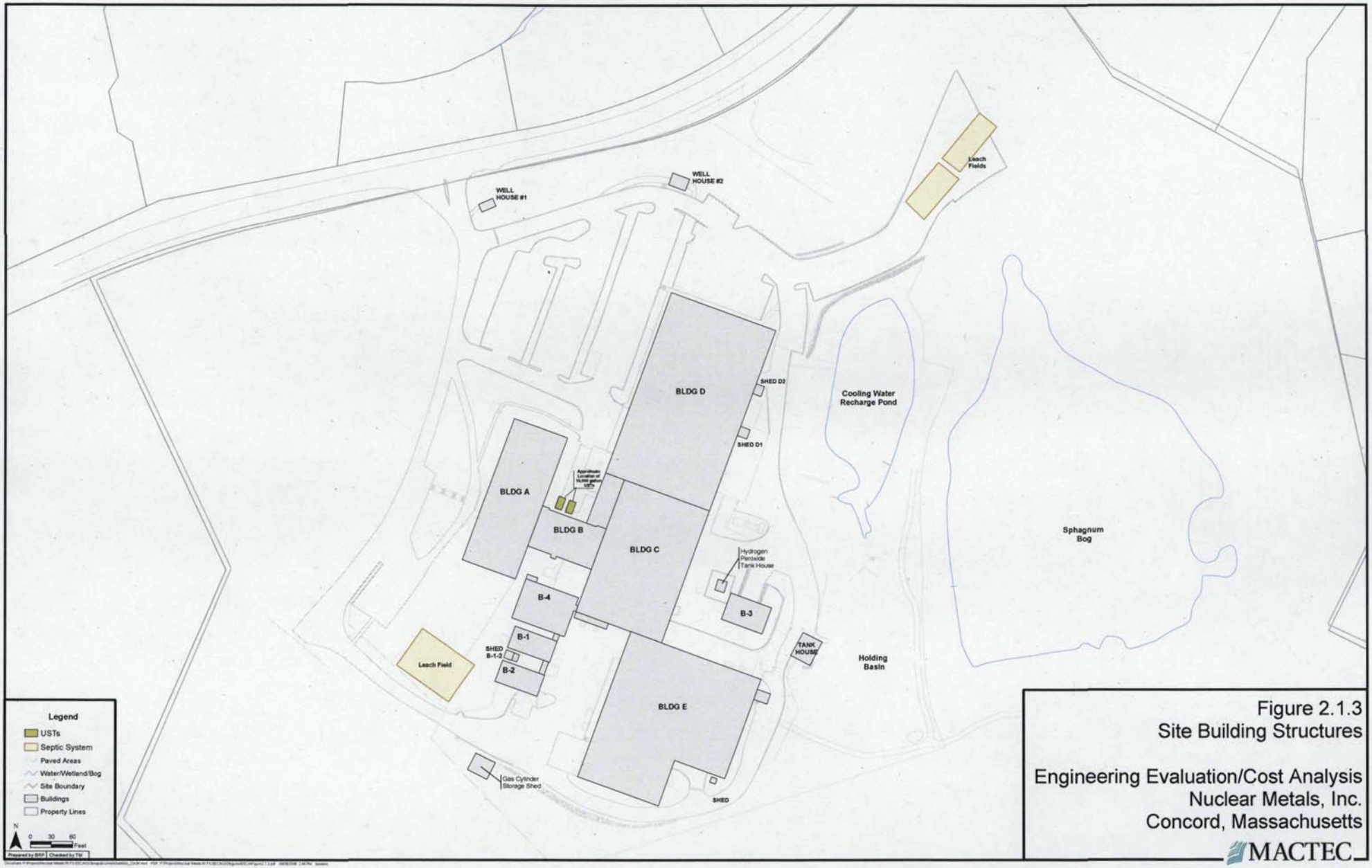

Figure 2.1.3
Site Building Structures

Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

MACTEC

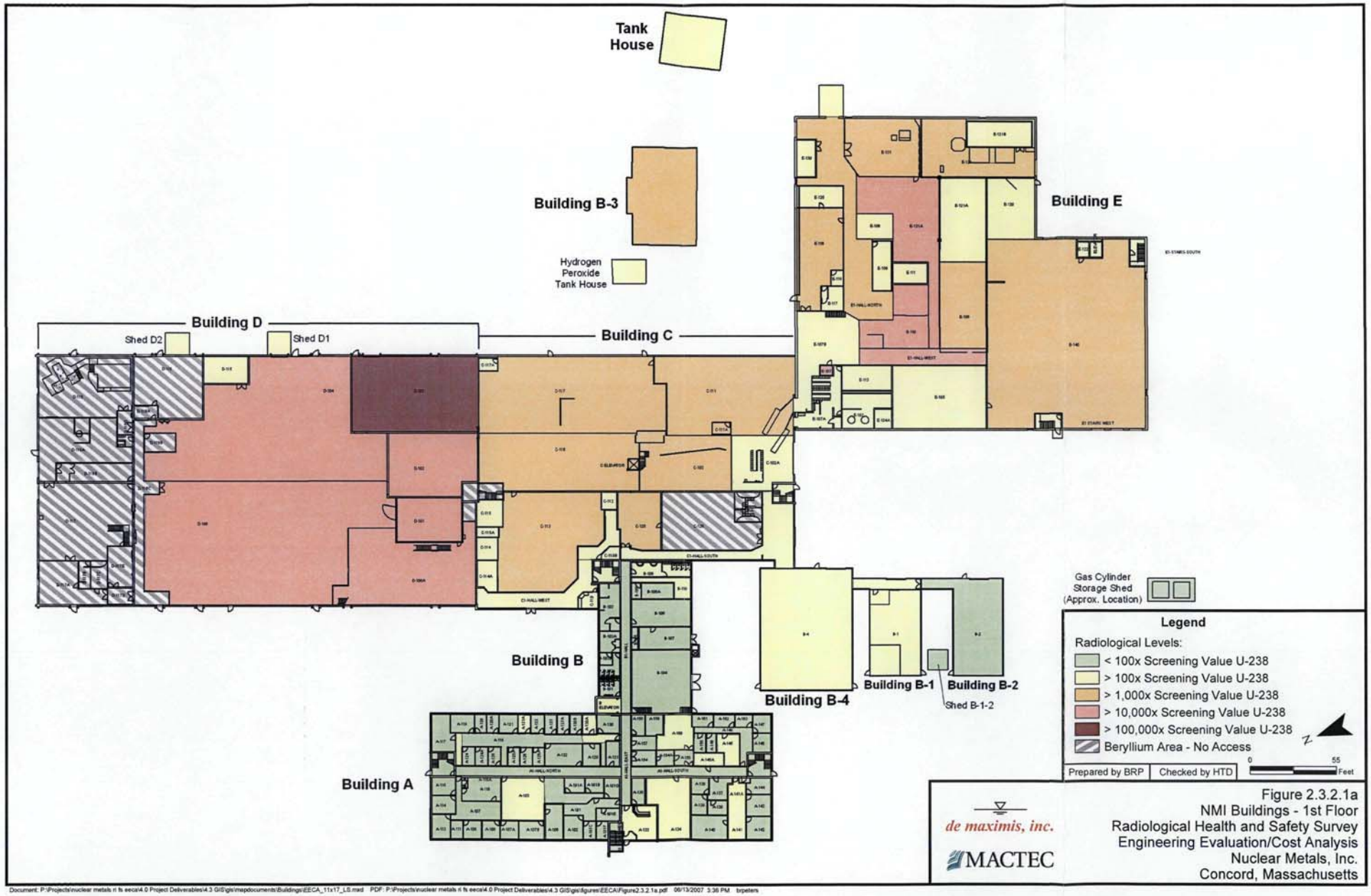

Figure 2.3.2.1a
NMI Buildings - 1st Floor
Radiological Health and Safety Survey
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

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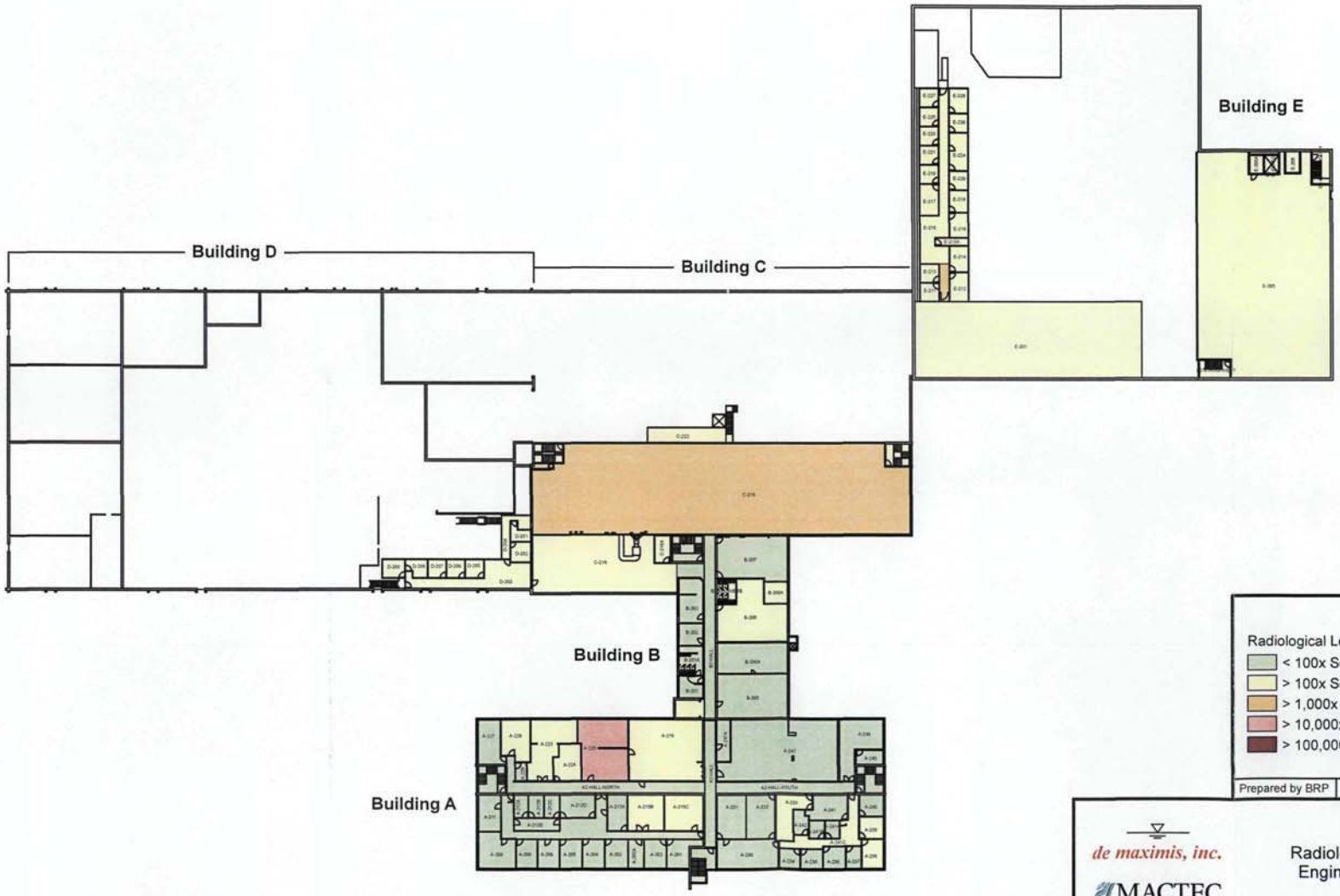

Legend

Radiological Levels:

- < 100x Screening Value U-238
- > 100x Screening Value U-238
- > 1,000x Screening Value U-238
- > 10,000x Screening Value U-238
- > 100,000x Screening Value U-238

N

Prepared by BRP | Checked by HTD

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de maximis, inc.

MACTEC

Figure 2.3.2.1b
NMI Buildings - 2nd Floor
Radiological Health and Safety Survey
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

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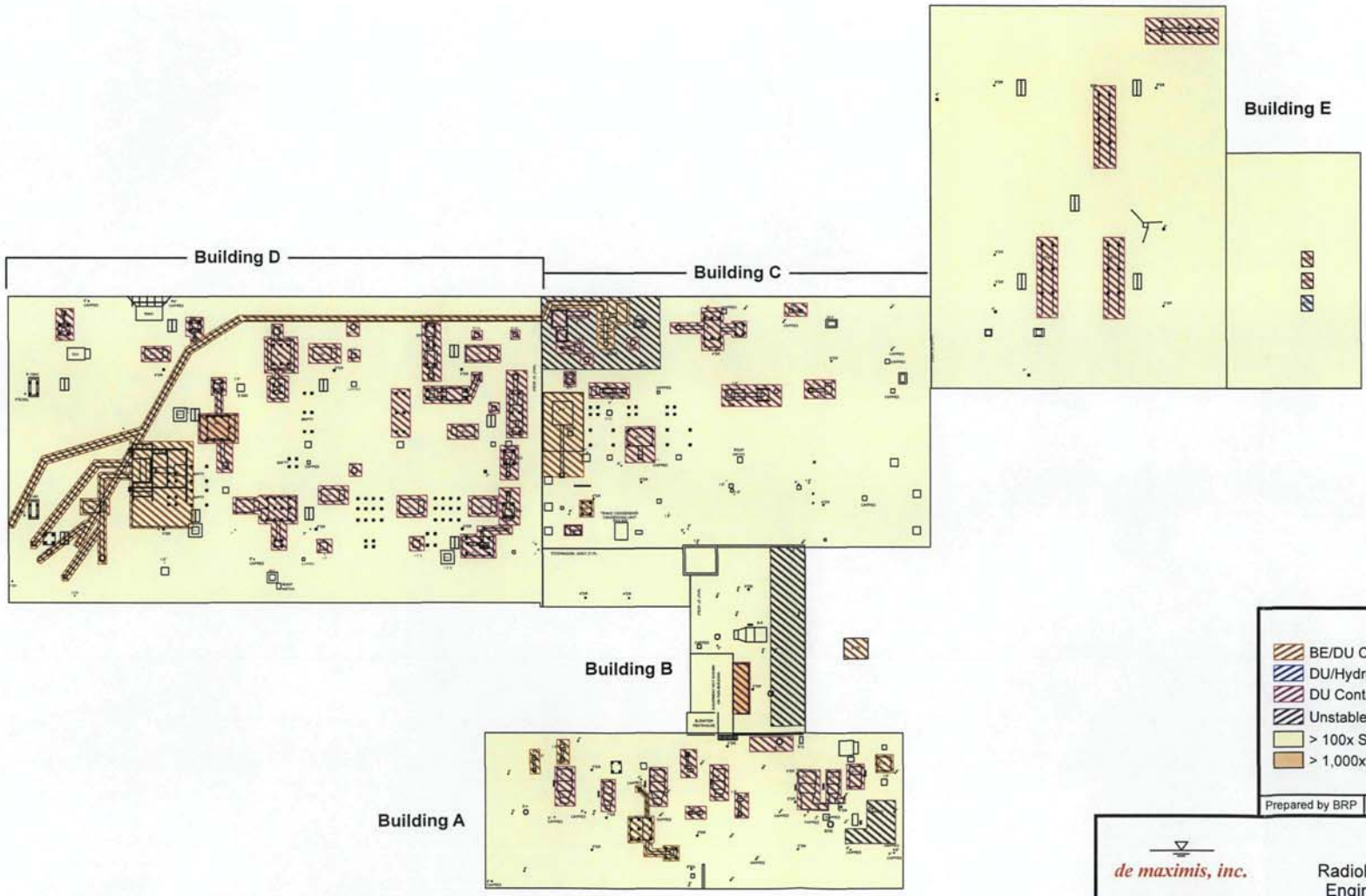

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Figure 2.3.2.1c
NMI Buildings - Roof
Radiological Health and Safety Survey
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

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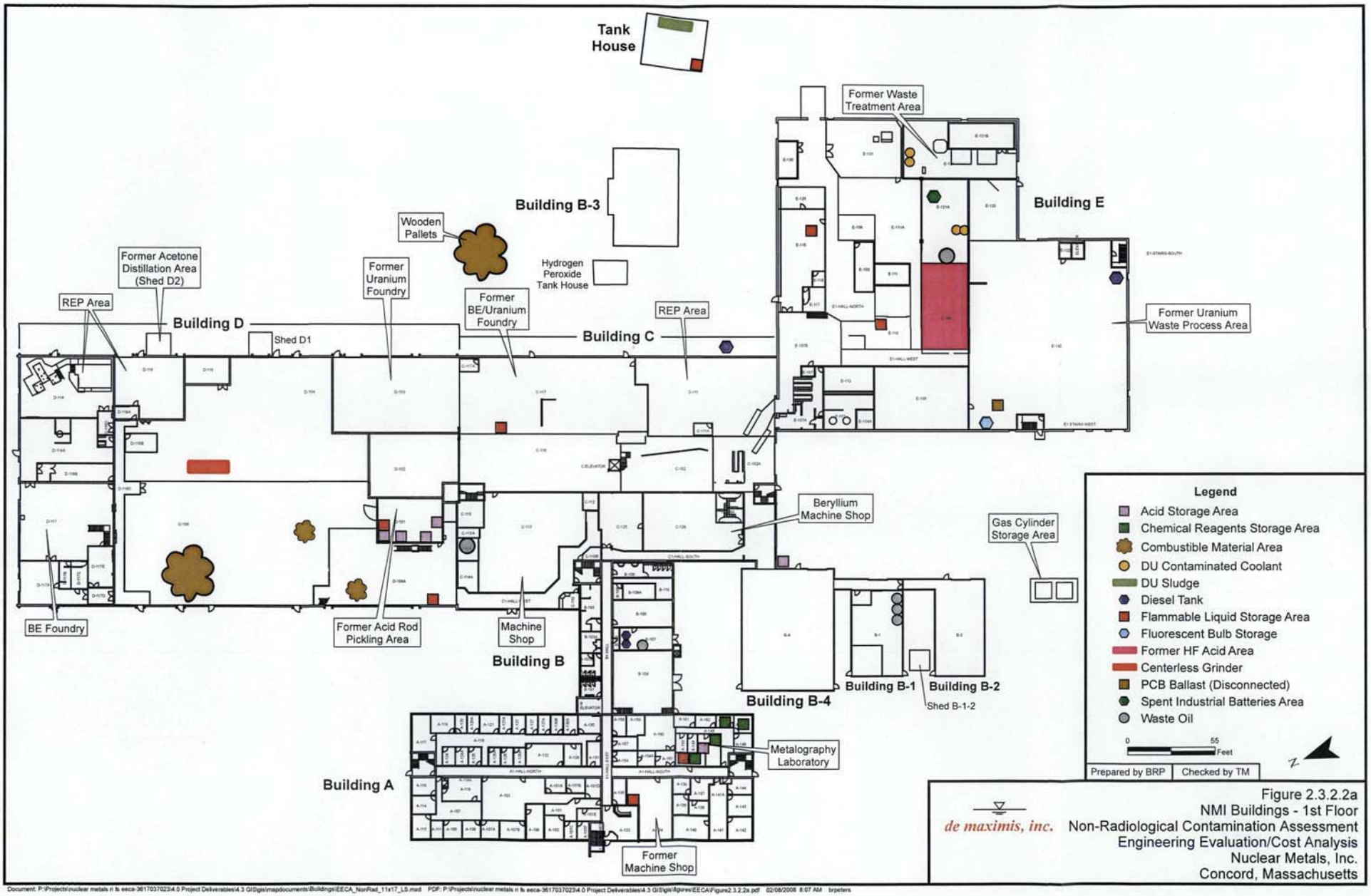

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Figure 2.3.2.2a
NMI Buildings - 1st Floor
Non-Radiological Contamination Assessment
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

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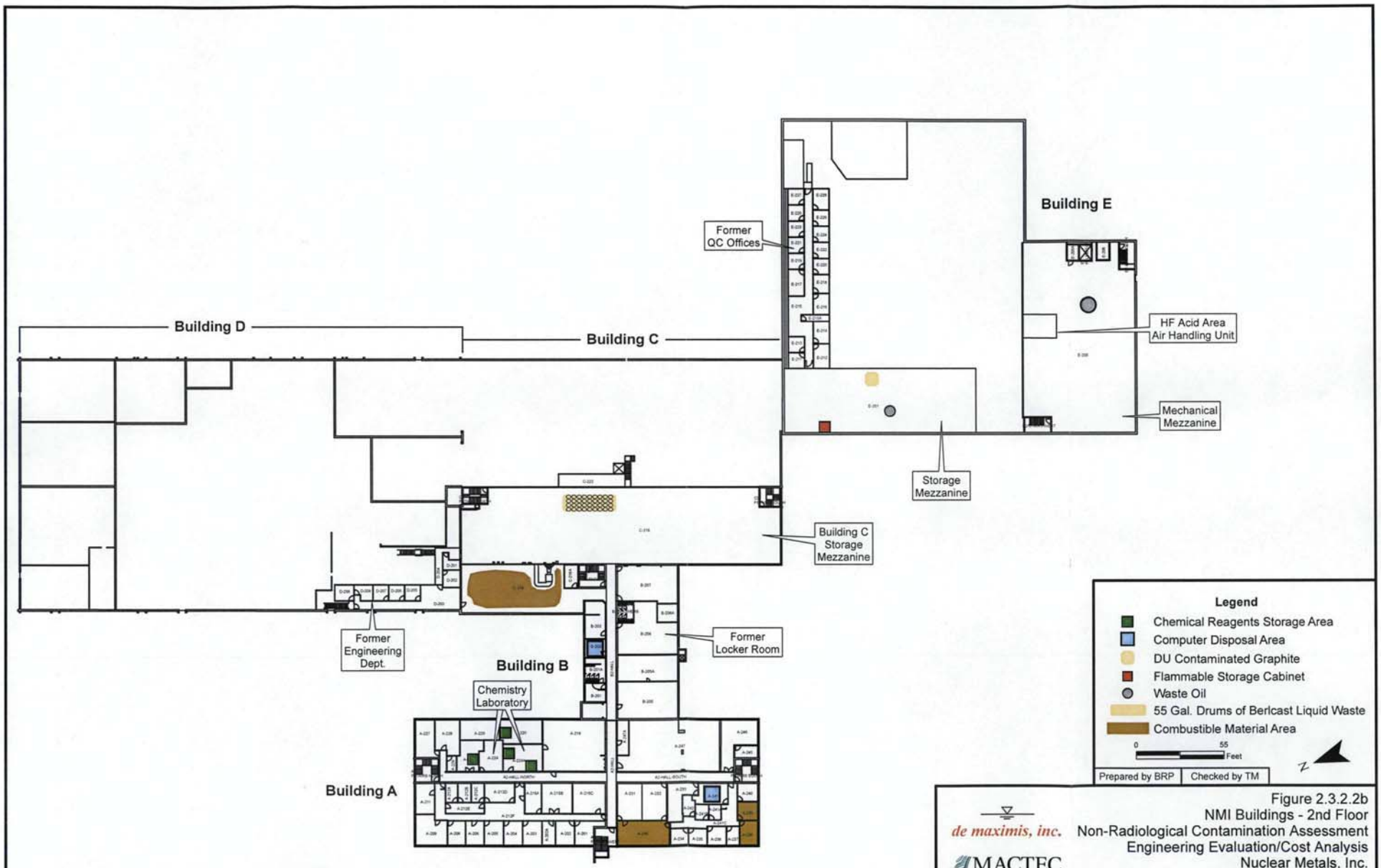

Figure 2.3.2.2b
NMI Buildings - 2nd Floor
Non-Radiological Contamination Assessment
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

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Tables

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

NRC Industrial / Commercial Exposure RESRAD Limits	NRC Screening Values (25 mrem/yr basis)	DPH Screening Values (10 mrem/yr basis)
	DPM / 100 cm^2	
Th-232	6	2.4
Th-232+C 2	5	2
U-234	80	32
U-235	87	34.8
U-238	**100**	**40**

Direct Reading Color Coding (highest value in room)	
	<= MADPH 10 mrem/yr Screening Value for U-238 (40 dpm / 100 cm2)
	> 1x MADPH Screening Value for U-238
	> 10x MADPH Screening Value for U-238
	> 100x MADPH Screening Value for U-238
	> 1,000x MADPH Screening Value for U-238
	> 10,000x MADPH Screening Value for U-238
	> 100,000x MADPH Screening Value for U-238

Survey Location	Fixed Activity		Removable Activity				Comments
	Gross Alpha/Beta Survey Results (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	Beta (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	Alpha (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	
Radiological Survey Results - January 2006, de maximis, inc							
Building A							
Room A-115 - Floor	1,500	38	117	3	18	None	
Room A-117 - Floor	3,900	98	165	4	9	None	
Room A-118 - Floor	30,000	750	135	3	3	None	Average of four measurements
Room A-128 - Floor	4,500	113	111	3	3	None	
Room A-130 - Floor	3,600	90	117	3	0	None	
Room A-134 - Floor	9,000	225	180	5	9	None	Average of four measurements
Room A-145A Floor	4,350	109	162	4	0	None	
Room A-156 Floor	10,500	263	165	4	0	None	
Room A-160 Floor	2,100	53	75	2	0	None	
Room A-145 Floor	6,000	150	225	6	21	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Room A-215C Floor	12,000	300	111	3	0	None	
Room A-216 Floor	15,000	375	147	4	9	None	
Room A-216 Wall	15,000	375	81	2	0	None	
Room A-220 Floor	30,000	750	162	4	0	None	
Room A-223 Floor	1,425	36	111	3	0	None	
Room A-224 Floor	1,350	34	129	3	3	None	
Room A-224A Wall	375,000	9,375	129	4	3	None	
Room A-234 Floor	2,550	64	117	3	0	None	
Room A-235 Floor	1,800	45	252	6	9	None	
Room A-241C Hall Floor	15,000	375	147	4	9	None	
Room A-225 Floor	3,000	75	117	3	0	None	
Room A-246 Floor	75,000	1875	180	5	0	None	
Room A-233 Floor	27,000	675	63	2	0	None	
Room A2/ General Area-Hall	NR	NR	129	3	0	None	Dose Rate = 13 uR/hr
Room A-2/ General Area-Hall North	NR	NR	147	4	3	None	Dose Rate = 11 uR/hr
Room A2/ General Area-Hall South	NR	NR	99	2	18	None	Dose Rate = 11 uR/hr
Room A-1/ General Area- Hall	NR	NR	144	4	3	None	Dose Rate = 12 uR/hr
Room A-1/ General Area-Hall North	NR	NR	153	4	0	None	Dose Rate = 15 uR/hr
Room A-1 General Area Hall South	NR	NR	144	4	0	None	Dose Rate = 10 uR/hr

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building B							
Room B-1/ General Area Hall	NR	NR	135	3	18	None	Dose Rate = 15 uR/hr
Room B-2/ General Area Hall	NR	NR	180	5	0	None	Dose Rate = 13 uR/hr
Building C							
Room C-117 Floor	285,000	7,125	1,494	37	228	6	
Room C-113 Floor	240,000	6,000	867	22	162	4	
Room C-111 Floor	54,000	1,350	1,440	36	126	3	
Room C1-Hall South/ Floor	15,000	375	273	7	9	None	
Room C-125/ Floor	270,000	6,750	651	16	75	2	
Room C1-Hall West/ Floor	1,800	45	180	5	3	None	
Building D							
Room D-103 Floor	360,000	9,000	1,362	34	243	6	
Room D-106A Hall	30,000	750	156	4	9	None	
Room D-102 Floor	45,000	1,125	1,146	29	153	4	
Building E							
Room E-1 Hall North/ Floor	18,000	450	2,847	71	414	10	
Room E-107B Floor	15,000	375	1,539	38	144	4	
Room E-1 Hall West/ Floor	750,000	18,750	1,287	32	219	5	

Radiological Survey Results - Oct. - Nov. 2006, MADPH - RCP							
Building A							
N Storage Area (A)	292	7	-33	-1	-6	None	
Room A-132/ Conference Room	28,882	722	-23	-1	-1	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Room A-103/ Office	1,699	42	-11	0	-3	None	
Room A-130/ Office	11,014	275	1	0	-3	None	
Room A-117/ Hallway	15,542	389	35	1	-3	None	
Room A-121	4,783	120	-7	0	2	None	
John Bulk Office	3,336	83	-2	0	-6	None	
Room A-162	8,312	208	NR	NR	NR	None	
Room A-161	8,933	223	NR	NR	NR	None	
Room A-160/ Lab	91,161	2,279	-14	0	-1	None	
Room A-160/ Lab	9,477	237	8	0	-3	None	
2nd Floor Hall (A)	12,843	321	-2	0	-1	None	
2nd Floor Office (A)	18,322	458	NR	NR	NR	None	
Cafeteria	3,115	78	-4	0	-1	None	
Cafeteria	2,393	60	NR	NR	NR	None	
Mold Storage Room (A)	4,960	124	-14	0	-1	None	
Mold Storage Room (A)	14,129	353	-11	0	-6	None	
Wax Room (New)	3,281	82	NR	NR	NR	None	
Wax Room (New)	67,277	1,682	27	1	2	None	
Wax Room (Old)	62,968	1,574	-11	0	-1	None	
Wax Room (Old)	8,330	208	-14	0	2	None	
Wax Injection Room	15,848	396	NR	NR	NR	None	
Wax Injection Room	5,483	137	NR	NR	NR	None	
2nd Floor Men's Room (Old)	24,305	608	NR	NR	NR	None	
2nd Floor Men's Room (Old)	5,426	136	NR	NR	NR	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

2nd Floor Men's Room (Old)	99,663	2,492	NR	NR	NR	None	
2nd Floor Men's Room (Old)	6,176	154	NR	NR	NR	None	
2nd Floor Men's Room (Old)	6,795	170	NR	NR	NR	None	
Roof Over (A)	157,077	3,927	NR	NR	NR	None	
Roof Over (A)	23,593	590	NR	NR	NR	None	
Lobby/ Floor (Carpet)	1,968	49	NR	NR	NR	None	
Lobby/ Floor Drain	5,696	142	-11	0	-1	None	
Lobby/ Stair Step	6,710	168	35	1	-3	None	
Bldg A Hallway/ Floor Drain	6,267	157	-11	0	-1	None	
Bldg A Hallway/ Floor Drain	9,050	226	-11	0	2	None	
Bldg A Hallway/ Floor Drain	1,312	33	1	0	2	None	
Bldg A Hallway/ Elevator Floor	18,135	453	8	0	-3	None	
Bldg A Hallway/ Floor Seam	3,351	84	-11	0	8	None	
Bldg A Hallway/ Floor Drain	12,167	304	-21	-1	-3	None	
Bldg A Hallway/ Wall Ledge	11,844	296	-31	-1	-1	None	
Bldg A Hallway/ Floor	19,689	492	27	1	-3	None	
Bldg A 2nd Floor/ Floor at Stair "Roof"	26,747	669	27	1	-3	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Bldg A 2nd Floor/ Boundary to Bldg C	4,680	117	3	0	-1	None	
Bldg A 2nd Floor/ Elevator Floor	10,003	250	3	0	-1	None	
Bldg A 2nd Floor/ Cinder-Block Wall	3,362	84	3	0	-1	None	
Building B							
Room B-207/ Waxroom Vent	2,025	51	51	1	0	None	
Building C							
Floor	143,067	3,577	104	3	26	None	
Floor (I Beam)	218,277	5,457	253	6	78	2	
Floor (Wall)	318,151	7,954	239	6	49	1	
Floor (Drain)	1,112,048	27,801	678	17	251	6	
Tray	3,627,277	90,682	6,033	151	1,055	26	
Floor Seam	1,785,309	44,633	611	15	95	2	
Floor (Under Platform)	1,974,977	49,374	4,614	115	930	23	
U Foundry (2nd Level)	4,923,959	123,099	4,903	123	1,627	41	
Floor (Wall Seam)	323,921	8,098	157	4	20	None	
Floor	357,914	8,948	282	7	89	2	
Room C-111/ Floor	167,512	4,188	292	7	98	2	
Room C-111/ Floor	76,834	1,921	99	2	0	None	
Room C-128/ Floor	144,860	3,622	391	10	219	5	
Room C-117/ Floor	500,000	12,500	88,942	2,224	385	10	
Room C-116/ CA	NR	NR	442	11	98	2	
Room C-125/ Band Saw	1,078,444	26,961	1,795	45	599	15	
Room C-113/ Floor	108,803	2,720	311	8	66	2	
Room C-117/ Scale	872,960	21,824	6,624	166	1,152	29	
Room C-117/ Stairs	338,937	8,473	598	15	216	5	
Room C-114/ Hallway	108,803	2,720	492	12	101	3	
Room C-114/ Floor	100,878	2,522	311	8	107	3	
Room C-216A/ Respirator Room	442	11	17	0	0	None	
Room C-216/ Storage Area (concrete)	43,341	1,084	10	0	12	None	
Room C-216/ Mezzanine	78,202	1,955	10	0	6	None	
Room C-216/ Mezzanine	102,754	2,569	48	1	20	None	
Room C-216/ Mezzanine	1,260,135	31,503	63	2	6	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building D							
Room D-102/ Floor	1,424,155	35,604	5,526	138	777	19	
Room D-101/ Floor (against wall)	3,326,307	83,158	1,040	26	590	15	
Room D-101/ Sulfuric Acid Bin	1,025,543	25,639	405	10	167	4	
Room D-106A/ Floor	1,689,762	42,244	1,373	34	582	15	
Room D-104/ Floor	598,418	14,960	729	18	170	4	
Room D-106/ Outside "Be" Airlock	NR	NR	193	5	95	2	
Room D-104/ Catch Pan	2,063,752	51,594	866	22	46	1	
Room D-106/ Floor	608,726	15,218	290	7	225	6	
Room D-106/ Floor Grating	1,532,994	38,325	1,395	35	245	6	
Room D-106/ Floor Grating	993,166	24,829	1,014	25	-12	None	
Room D-205/ Office Floor	14,400	360	-12	0	9	None	
Room D-206/ Office Floor	19,580	490	-2	0	6	None	
Room D-207/ Office Floor	9,380	235	24	1	9	None	
Room D-208/ Office Floor	21,695	542	7	0	0	None	
Room D-203/ Hallway	27,760	694	41	1	3	None	
Room D-208/ Office Floor	NR	NR	10	0	12	None	
Conference Area	72,065	1,802	36	1	9	None	
Room D-115/ Electrical Room	4,524	113	41	1	0	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building E							
Inside Pump Housing	2,105,933	52,648	8,422	211	1,673	42	
E-131A/ Floor (Roof Drain Base)	483,943	12,099	188	5	66	2	
Table	2,773,458	69,336	4,457	111	553	14	
Floor	209,961	5,249	456	11	144	4	
DU Block Material	3,566,248	89,156	1,819	45	766	19	
E-110/ Pallet Jack Rollers	1,213,089	30,327	287	7	141	4	
E-110/ Hand Cart	1,117,847	27,946	1,081	27	314	8	
Floor Seam	1,360,804	34,020	606	15	202	5	
Floor Seam	656,547	16,414	471	12	173	4	
E-106/ "Erect Vator" Equipment	2,486,809	62,170	4,472	112	1,054	26	
Floor	339,993	8,500	1,279	32	259	6	
Forklift	63,530	1,588	391	10	104	3	
Scale	67,384	1,685	801	20	331	8	
Floor Drain	500,158	12,504	891	22	94	2	
Assembly Line	890	22	533	13	199	5	
Oven	2,333,719	58,343	6,474	162	2,053	51	
Floor Seam	79,859	1,996	666	17	196	5	
Equipment	1,566,419	39,160	17,066	427	2,637	66	
Equipment	236,035	5,901	45,449	1,136	3,838	96	
Floor	478,426	11,961	582	15	173	4	
Equipment	347,535	8,688	13,255	331	939	23	
Floor	164,238	4,106	333	8	84	2	
Wood Block	183,347	4,584	500	13	164	4	
Bench Top	33,550	839	502	13	58	1	
Pump (Equipment)	201,453	5,036	560	14	176	4	
Duct Work	12,349	309	278	7	78	2	
Drywall	12,474	312	97	2	29	None	
Floor	6,119	153	270	7	92	2	
Cutting Table	12,734	318	94	2	12	None	
Tool Cabinet	8,029	201	154	4	66	2	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

NRC Industrial / Commercial Exposure RESRAD Limits	NRC Screening Values (25 mrem/yr basis)	DPH Screening Values (10 mrem/yr basis)
	DPM / 100 cm^2	
Th-232	6	2.4
Th-232+C 2	5	2
U-234	80	32
U-235	87	34.8
U-238	**100**	**40**

Direct Reading Color Coding (highest value in room)
<= MADPH 10 mrem/yr Screening Value for U-238 (40 dpm / 100 cm2)
> 1x MADPH Screening Value for U-238
> 10x MADPH Screening Value for U-238
> 100x MADPH Screening Value for U-238
> 1,000x MADPH Screening Value for U-238
> 10,000x MADPH Screening Value for U-238
> 100,000x MADPH Screening Value for U-238

Survey Location	Fixed Activity		Removable Activity				Comments
	Gross Alpha/Beta Survey Results (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	Beta (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	Alpha (dpm/100 cm^2)	Exceedence Ratio for U-238 (MADPH 10 mrem/yr basis)	
Radiological Survey Results - January 2006, de maximis, inc							
Building A							
Room A-115 - Floor	1,500	38	117	3	18	None	
Room A-117 - Floor	3,900	98	165	4	9	None	
Room A-118 - Floor	30,000	750	135	3	3	None	Average of four measurements
Room A-128 - Floor	4,500	113	111	3	3	None	
Room A-130 - Floor	3,600	90	117	3	0	None	
Room A-134 - Floor	9,000	225	180	5	9	None	Average of four measurements
Room A-145A Floor	4,350	109	162	4	0	None	
Room A-156 Floor	10,500	263	165	4	0	None	
Room A-160 Floor	2,100	53	75	2	0	None	
Room A-145 Floor	6,000	150	225	6	21	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Room A-215C Floor	12,000	300	111	3	0	None	
Room A-216 Floor	15,000	375	147	4	9	None	
Room A-216 Wall	15,000	375	81	2	0	None	
Room A-220 Floor	30,000	750	162	4	0	None	
Room A-223 Floor	1,425	36	111	3	0	None	
Room A-224 Floor	1,350	34	129	3	3	None	
Room A-224A Wall	375,000	9,375	129	4	3	None	
Room A-234 Floor	2,550	64	117	3	0	None	
Room A-235 Floor	1,800	45	252	6	9	None	
Room A-241C Hall Floor	15,000	375	147	4	9	None	
Room A-225 Floor	3,000	75	117	3	0	None	
Room A-246 Floor	75,000	1875	180	5	0	None	
Room A-233 Floor	27,000	675	63	2	0	None	
Room A2/ General Area-Hall	NR	NR	129	3	0	None	Dose Rate = 13 uR/hr
Room A-2/ General Area-Hall North	NR	NR	147	4	3	None	Dose Rate = 11 uR/hr
Room A2/ General Area-Hall South	NR	NR	99	2	18	None	Dose Rate = 11 uR/hr
Room A-1/ General Area- Hall	NR	NR	144	4	3	None	Dose Rate = 12 uR/hr
Room A-1/ General Area-Hall North	NR	NR	153	4	0	None	Dose Rate = 15 uR/hr
Room A-1 General Area Hall South	NR	NR	144	4	0	None	Dose Rate = 10 uR/hr

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building B							
Room B-1/ General Area Hall	NR	NR	135	3	18	None	Dose Rate = 15 uR/hr
Room B-2/ General Area Hall	NR	NR	180	5	0	None	Dose Rate = 13 uR/hr
Building C							
Room C-117 Floor	285,000	7,125	1,494	37	228	6	
Room C-113 Floor	240,000	6,000	867	22	162	4	
Room C-111 Floor	54,000	1,350	1,440	36	126	3	
Room C1-Hall South/ Floor	15,000	375	273	7	9	None	
Room C-125/ Floor	270,000	6,750	651	16	75	2	
Room C1-Hall West/ Floor	1,800	45	180	5	3	None	
Building D							
Room D-103 Floor	360,000	9,000	1,362	34	243	6	
Room D-106A Hall	30,000	750	156	4	9	None	
Room D-102 Floor	45,000	1,125	1,146	29	153	4	
Building E							
Room E-1 Hall North/ Floor	18,000	450	2,847	71	414	10	
Room E-107B Floor	15,000	375	1,539	38	144	4	
Room E-1 Hall West/ Floor	750,000	18,750	1,287	32	219	5	

Radiological Survey Results - Oct. - Nov. 2006, MADPH - RCP							
Building A							
N Storage Area (A)	292	7	-33	-1	-6	None	
Room A-132/ Conference Room	28,882	722	-23	-1	-1	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Room A-103/ Office	1,699	42	-11	0	-3	None	
Room A-130/ Office	11,014	275	1	0	-3	None	
Room A-117/ Hallway	15,542	389	35	1	-3	None	
Room A-121	4,783	120	-7	0	2	None	
John Bulk Office	3,336	83	-2	0	-6	None	
Room A-162	8,312	208	NR	NR	NR	None	
Room A-161	8,933	223	NR	NR	NR	None	
Room A-160/ Lab	91,161	2,279	-14	0	-1	None	
Room A-160/ Lab	9,477	237	8	0	-3	None	
2nd Floor Hall (A)	12,843	321	-2	0	-1	None	
2nd Floor Office (A)	18,322	458	NR	NR	NR	None	
Cafeteria	3,115	78	-4	0	-1	None	
Cafeteria	2,393	60	NR	NR	NR	None	
Mold Storage Room (A)	4,960	124	-14	0	-1	None	
Mold Storage Room (A)	14,129	353	-11	0	-6	None	
Wax Room (New)	3,281	82	NR	NR	NR	None	
Wax Room (New)	67,277	1,682	27	1	2	None	
Wax Room (Old)	62,968	1,574	-11	0	-1	None	
Wax Room (Old)	8,330	208	-14	0	2	None	
Wax Injection Room	15,848	396	NR	NR	NR	None	
Wax Injection Room	5,483	137	NR	NR	NR	None	
2nd Floor Men's Room (Old)	24,305	608	NR	NR	NR	None	
2nd Floor Men's Room (Old)	5,426	136	NR	NR	NR	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

2nd Floor Men's Room (Old)	99,663	2,492	NR	NR	NR	None	
2nd Floor Men's Room (Old)	6,176	154	NR	NR	NR	None	
2nd Floor Men's Room (Old)	6,795	170	NR	NR	NR	None	
Roof Over (A)	157,077	3,927	NR	NR	NR	None	
Roof Over (A)	23,593	590	NR	NR	NR	None	
Lobby/ Floor (Carpet)	1,968	49	NR	NR	NR	None	
Lobby/ Floor Drain	5,696	142	-11	0	-1	None	
Lobby/ Stair Step	6,710	168	35	1	-3	None	
Bldg A Hallway/ Floor Drain	6,267	157	-11	0	-1	None	
Bldg A Hallway/ Floor Drain	9,050	226	-11	0	2	None	
Bldg A Hallway/ Floor Drain	1,312	33	1	0	2	None	
Bldg A Hallway/ Elevator Floor	18,135	453	8	0	-3	None	
Bldg A Hallway/ Floor Seam	3,351	84	-11	0	8	None	
Bldg A Hallway/ Floor Drain	12,167	304	-21	-1	-3	None	
Bldg A Hallway/ Wall Ledge	11,844	296	-31	-1	-1	None	
Bldg A Hallway/ Floor	19,689	492	27	1	-3	None	
Bldg A 2nd Floor/ Floor at Stair "Roof"	26,747	669	27	1	-3	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Bldg A 2nd Floor/ Boundary to Bldg C	4,680	117	3	0	-1	None	
Bldg A 2nd Floor/ Elevator Floor	10,003	250	3	0	-1	None	
Bldg A 2nd Floor/ Cinder-Block Wall	3,362	84	3	0	-1	None	
Building B							
Room B-207/ Waxroom Vent	2,025	51	51	1	0	None	
Building C							
Floor	143,067	3,577	104	3	26	None	
Floor (I Beam)	218,277	5,457	253	6	78	2	
Floor (Wall)	318,151	7,954	239	6	49	1	
Floor (Drain)	1,112,048	27,801	678	17	251	6	
Tray	3,627,277	90,682	6,033	151	1,055	26	
Floor Seam	1,785,309	44,633	611	15	95	2	
Floor (Under Platform)	1,974,977	49,374	4,614	115	930	23	
U Foundry (2nd Level)	4,923,959	123,099	4,903	123	1,627	41	
Floor (Wall Seam)	323,921	8,098	157	4	20	None	
Floor	357,914	8,948	282	7	89	2	
Room C-111/ Floor	167,512	4,188	292	7	98	2	
Room C-111/ Floor	76,834	1,921	99	2	0	None	
Room C-128/ Floor	144,860	3,622	391	10	219	5	
Room C-117/ Floor	500,000	12,500	88,942	2,224	385	10	
Room C-116/ CA	NR	NR	442	11	98	2	
Room C-125/ Band Saw	1,078,444	26,961	1,795	45	599	15	
Room C-113/ Floor	108,803	2,720	311	8	66	2	
Room C-117/ Scale	872,960	21,824	6,624	166	1,152	29	
Room C-117/ Stairs	338,937	8,473	598	15	216	5	
Room C-114/ Hallway	108,803	2,720	492	12	101	3	
Room C-114/ Floor	100,878	2,522	311	8	107	3	
Room C-216A/ Respirator Room	442	11	17	0	0	None	
Room C-216/ Storage Area (concrete)	43,341	1,084	10	0	12	None	
Room C-216/ Mezzanine	78,202	1,955	10	0	6	None	
Room C-216/ Mezzanine	102,754	2,569	48	1	20	None	
Room C-216/ Mezzanine	1,260,135	31,503	63	2	6	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building D							
Room D-102/ Floor	1,424,155	35,604	5,526	138	777	19	
Room D-101/ Floor (against wall)	3,326,307	83,158	1,040	26	590	15	
Room D-101/ Sulfuric Acid Bin	1,025,543	25,639	405	10	167	4	
Room D-106A/ Floor	1,689,762	42,244	1,373	34	582	15	
Room D-104/ Floor	598,418	14,960	729	18	170	4	
Room D-106/ Outside "Be" Airlock	NR	NR	193	5	95	2	
Room D-104/ Catch Pan	2,063,752	51,594	866	22	46	1	
Room D-106/ Floor	608,726	15,218	290	7	225	6	
Room D-106/ Floor Grating	1,532,994	38,325	1,395	35	245	6	
Room D-106/ Floor Grating	993,166	24,829	1,014	25	-12	None	
Room D-205/ Office Floor	14,400	360	-12	0	9	None	
Room D-206/ Office Floor	19,580	490	-2	0	6	None	
Room D-207/ Office Floor	9,380	235	24	1	9	None	
Room D-208/ Office Floor	21,695	542	7	0	0	None	
Room D-203/ Hallway	27,760	694	41	1	3	None	
Room D-208/ Office Floor	NR	NR	10	0	12	None	
Conference Area	72,065	1,802	36	1	9	None	
Room D-115/ Electrical Room	4,524	113	41	1	0	None	

Table 2-1
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Summary of Radiological Survey Results

Building E							
Inside Pump Housing	2,105,933	52,648	8,422	211	1,673	42	
E-131A/ Floor (Roof Drain Base)	483,943	12,099	188	5	66	2	
Table	2,773,458	69,336	4,457	111	553	14	
Floor	209,961	5,249	456	11	144	4	
DU Block Material	3,566,248	89,156	1,819	45	766	19	
E-110/ Pallet Jack Rollers	1,213,089	30,327	287	7	141	4	
E-110/ Hand Cart	1,117,847	27,946	1,081	27	314	8	
Floor Seam	1,360,804	34,020	606	15	202	5	
Floor Seam	656,547	16,414	471	12	173	4	
E-106/ "Erect Vator" Equipment	2,486,809	62,170	4,472	112	1,054	26	
Floor	339,993	8,500	1,279	32	259	6	
Forklift	63,530	1,588	391	10	104	3	
Scale	67,384	1,685	801	20	331	8	
Floor Drain	500,158	12,504	891	22	94	2	
Assembly Line	890	22	533	13	199	5	
Oven	2,333,719	58,343	6,474	162	2,053	51	
Floor Seam	79,859	1,996	666	17	196	5	
Equipment	1,566,419	39,160	17,066	427	2,637	66	
Equipment	236,035	5,901	45,449	1,136	3,838	96	
Floor	478,426	11,961	582	15	173	4	
Equipment	347,535	8,688	13,255	331	939	23	
Floor	164,238	4,106	333	8	84	2	
Wood Block	183,347	4,584	500	13	164	4	
Bench Top	33,550	839	502	13	58	1	
Pump (Equipment)	201,453	5,036	560	14	176	4	
Duct Work	12,349	309	278	7	78	2	
Drywall	12,474	312	97	2	29	None	
Floor	6,119	153	270	7	92	2	
Cutting Table	12,734	318	94	2	12	None	
Tool Cabinet	8,029	201	154	4	66	2	

Table 3-1
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Chemical-Specific ARARs and TBCs

Regulatory Level	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
Federal	The Department of Energy Order 5400.5, Authorized Limits for Unrestricted Release	To Be Considered	Establishes surface contamination levels for building materials and standards for unrestricted release of equipment or materials.	This guidance will be considered when determining disposal or reuse options for demolition debris.
Federal	Toxic Substances Control Act (TSCA) Polychlorinated Biphenyl (PCB) Remediation waste (40 CFR 761)	Applicable	Provides cleanup and disposal options for PCB remediation waste.	Cleanup of PCB waste occurring during the removal action will be conducted in accordance with these requirements.
Federal	RCRA Manifest System, Recordkeeping, and Reporting (40 CFR 264, subpart E)	Applicable	This regulation outlines the requirements to track hazardous waste activities, including the manifest system, operating records, and reporting.	Removal action activities will be conducted to comply with the requirements of these regulations.
Federal	RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)	Applicable	This regulation establishes procedures to be followed when transporting manifested hazardous waste within the United States.	Transporters of hazardous waste for off-site treatment and/or disposal will comply with these requirements.
Federal	Radioactive Manifesting Requirements (NRC 10 CFR 20.2006)	Applicable	This regulation establishes procedures to be followed when transporting manifested radioactive waste within the United States.	Transporters of radioactive waste for off-site treatment and/or disposal will comply with these requirements.
Federal	Transportation of Radioactive Material (DOT 49 CFR 173)	Applicable	This regulation establishes procedures to be followed when transporting radioactive waste within the United States.	Transporters of radioactive waste for off-site treatment and/or disposal will comply with these requirements.
Federal	Packaging & Transportation of Radioactive Material (10 CFR 71	Applicable	This regulation establishes procedures to be followed when packaging and transporting radioactive waste within the United States.	Packaging personnel and transporters of radioactive waste for off-site treatment and/or disposal will comply with these requirements.
State	Massachusetts Regulations for the	Applicable	Establishes standards for radiation-related activities.	Removal activities will be conducted in compliance with these regulations,

Table 3-1
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Chemical-Specific ARARs and TBCs

Regulatory Level	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
	Control of Radiation (105 CMR 120)			including the requirement to achieve the 10 millirem per year exposure standard for unrestricted radiological release.

Table 3-2
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Action-Specific ARARs and TBCs

Regulatory Level	Action/Trigger	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
Federal	Air Emissions	CAA National Emission Standards for Hazardous Air Pollutants (NESHAP) – Radionuclide Emissions (40 CFR 61, subpart H)	Relevant and Appropriate	40 CFR 61.92 specifies that a member of the general public shall not be exposed to emissions of radionuclides to ambient air in excess of an effective dose equivalent of 10 millirem/year.	Removal action activities will be conducted in accordance with these requirements.
Federal	Air Emissions	CAA National Emission Standards for Hazardous Air Pollutants (NESHAP) - Asbestos (40 CFR 61, subpart M)	Applicable	Subpart M provides emission standards for asbestos and asbestos-containing waste materials.	Removal action activities will be conducted in accordance with these requirements.
Federal	Control of surface water runoff, Direct discharge to surface water	Clean Water Act NPDES Permit Program [40 CFR 122 and 125]	Applicable	The NPDES permit program specifies the permissible concentration or level of contaminants in the discharge from any point source, including surface runoff, to waters of the United States.	To the extent that construction activities result in discharge to waters of the United States measures will be taken to meet substantive requirements of these regulations.
Federal	Identification of hazardous wastes	RCRA Identification and Listing of Hazardous Waste; Toxicity Characteristic (40 CFR 261.24)	Applicable	This requirement defines those wastes that are subject to regulation as hazardous waste.	Analytical results will be evaluated against the criteria and definitions of hazardous waste. The criteria and definition of hazardous waste will be referred to and utilized during removal action activities.
Federal	Storage and disposal of hazardous wastes	RCRA Standards Applicable to Generators of Hazardous Waste (40 CFR 262)	Applicable	These standards govern storage, labeling, accumulation times, and disposal of hazardous waste.	Any hazardous waste generated during removal action activities will be managed in accordance with these standards.

Table 3-2
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Action-Specific ARARs and TBCs

Regulatory Level	Action/Trigger	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
Federal	Use of containers to store hazardous wastes	RCRA Container Storage Requirements (40 CFR 264, Subpart I)	Applicable	These requirements apply to owners and operators of facilities that use container storage to store hazardous waste.	If containers are used to store materials that are hazardous wastes, the containers will be managed according to these rules.
Federal	Radiation Surveys and Investigations	Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC Regulation 1575)	To Be Considered	Provides a nationally consistent approach to conducting radiation surveys and investigations at potentially radiological contaminated sites.	Interior building surveys, if needed, may be conducted in accordance with MARSSIM.
Federal	Management of PCB-contaminated material	TSCA (40 CFR 761 D)	Applicable	These regulations govern the storage and final disposal of PCBs. The regulations also specify procedures to be followed in decontaminating containers and moveable equipment used in storage areas.	These regulations will be followed if PCB contaminated materials are encountered during the removal action..
Federal	Management of PCB-contaminated material	TSCA (40 CFR 761 subpart G, PCB Spill Cleanup Policy)	To Be Considered	This policy governs the cleanup of PCB spills occurring after May 4, 1987.	Should PCBs be encountered during demolition they will be handled in accordance with these requirements.

Table 3-2
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Action-Specific ARARs and TBCs

Regulatory Level	Action/Trigger	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
State	Receipt, ownership, possession, use, transfer, or disposal of any radiation source	Massachusetts Regulations for the Control of Radiation; (105 CMR 120)	Applicable	Massachusetts is an "Agreement State" and is responsible for regulation of all sources of radiation including naturally occurring radioactive material, byproduct material and special nuclear material. These regulations pertain to source material, byproduct material, and special nuclear materials in quantities not sufficient to form a critical mass and apply to the protection of workers and individuals against radiation, termination of licenses, decommissioning of facilities, and transportation of radioactive material.	The requirements of these regulations will be followed during the removal action / decommissioning activities at the Site.
State	Identification of hazardous Waste	Massachusetts Hazardous Waste Management Rules; (310 CMR 30.000)	Applicable	These regulations outline requirements and procedures for handling, storage, treatment, disposal, and record keeping at hazardous waste facilities.	These regulations will be followed for all on-site activities conducted. Those criteria and definitions more stringent than RCRA take precedence over federal requirements.
State	Discharges to surface water	Massachusetts Surface Water Discharge Permit Program; (314 CMR 3.00)	Applicable	These regulations apply to pollutant discharges to surface waters of the Commonwealth.	To the extent there is a discharge to waters of the Commonwealth during construction activities the requirements of these regulations will be met.

Table 3-2
NMI Superfund Site – Concord, MA
Engineering Evaluation and Cost Analysis
Potential Action-Specific ARARs and TBCs

Regulatory Level	Action/Trigger	Requirement/Citation	Status	Requirement/Synopsis	Action To Be Taken
State	Activities that affect ambient air quality	Massachusetts Air Pollution Control Regulations; (310 CMR 7.00)	Applicable	Particulate emissions from remedial activities must not exceed an annual geometric mean of 50 g/m3 and a maximum 24-hour concentration of 150 mg/m3 (primary standard). Carbon monoxide, nitrogen dioxide, and lead and other contaminants are also regulated. Visible emissions are limited.	Removal action activities will be conducted to meet the standards for Visible Emissions (310 CMR 7.06); Dust, Odor, Construction and Demolition (310 CMR 7.09); and Volatile Organic Compounds (310 CMR 7.18).

Table 4
NMI Superfund Site
Engineering Evaluation and Cost Analysis
Cost Estimate
Alternative 5 - Site Stabilization, Complete Removal of Hazardous Substances/Flammable/Combustible Material, Contents Removal, and Building Demolition, with On-Site or Off-Site Disposal

Item No.		Quantity	Unit	unit cost	Cost
1	**Administration Cost**				
				Administration Cost Subtotal (Rounded):	$450,000
2	**Pre-NTCRA Activities**				
				Pre-NTCRA Activities Cost Subtotal (Rounded):	$1,140,000
3	**Building Stabilization**				
				Building Stabilization Cost Subtotal (Rounded):	$8,425,000
4	**Building Contents Removal**				
				Bldg. Contents Removal Cost Subtotal (Rounded):	$3,805,000
5	**Interior Cleaning / Building Demolition**				
				Interior Cleaning / Bldg. Demolition Cost Subtotal (Rounded):	$1,890,000
6	**Transportation & Disposal (T & D)**				
				T & D Cost Subtotal (Rounded):	$29,965,000
				Initial Capital Costs (Items 1 -6) Subtotal:	**$45,675,000**
7	***Initial Capital Costs/Project Administration and Contingency Costs***				
7a				Initial Capital Costs:	$45,675,000
7b				Project Administration/Management Cost (15%):	$6,851,250
7c				Contingency Cost (25%):	$11,418,750
				Subtotal All:	$63,945,000
				TOTAL (Rounded):	**$63,945,000**

Appendices

APPENDIX A
EE/CA APPROVAL MEMORANDUM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET, BOSTON, MA 02114

DATE: **December 11, 2007**

SUBJ: Nuclear Metals, Incorporated Superfund Site - Approval to perform an Engineering Evaluation/Cost Analysis for a Non-Time Critical Removal Action

FROM: Melissa Taylor, Remedial Project Manager
MA Superfund Section

THRU: Larry Brill, Chief
Office of Site Remediation and Restoration I

TO: James T. Owens III, Director
Office of Site Remediation and Restoration

I. Subject

Investigations by the United States Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MADEP) have determined that there has been a release of hazardous substances to the environment at the Nuclear Metals, Inc. (NMI) Superfund Site ("the site") in Concord, Massachusetts. The site was listed on the National Priorities List (NPL) on June 14, 2001, with the concurrence of the Governor of Massachusetts.

This memorandum documents the decision to proceed with an Engineering Evaluation/Cost Analyses (EE/CAs) for a non-time critical removal action (NTCRA) at the site. The EE/CA will address contaminated buildings and structures located on site. The main facility consists of five inter-connected buildings known as buildings A-E. Four smaller metal buildings known as the "butler" buildings are located in back of the facility and were used for a number of purposes from shipping and receiving to storage and handling of wastes. A tank house that stores hydrogen peroxide solution in tanks contaminated with depleted uranium and a gas cylinder storage shed are also located on the site property. The location and layout of the site buildings is shown in Figure 1.

In the spring of 2006, MADEP conducted a removal action, with proceeds obtained by the State through a settlement with the U.S. Army, which consisted of the removal of more than 3,800 drums and containers containing depleted uranium from within the facility. In May 2007, the Massachusetts Department of Public Health Radiation Control Program (MADPH-RCP) and

Starmet entered into a Consent Decree under which Starmet has agreed to permanently vacate the Site by October 31, 2007. An EE/CA is necessary to address the deteriorating facility building and its contents due to the threat that the building and its contents pose to public health or welfare or the environment.

EPA is in the process of conducting a Remedial Investigation/Feasibility Study to evaluate the full nature and extent of contamination at the site not addressed by the removal action by MADEP, other prior time-critical removal actions, or by the proposed EE/CA. EPA does not expect to expend federal funds for this EE/CA as this EE/CA will be performed by the PRP group pursuant to the RI/FS Administrative Order by Consent, signed on June 13, 2003. This EE/CA will address on-site contaminated buildings and their contents. Other areas of the site are currently being investigated as part of the ongoing RI/FS and will be addressed under future remedial actions, if necessary. The EE/CA will propose a range of alternatives, from monitoring and access controls (i.e. site security), to complete removal of building contents and building demolition. Removal of sub-slab materials is not part of the scope of this EE/CA but will be addressed via the RI/FS.

The decision to proceed with an EE/CA is consistent with EPA guidance regarding Superfund Accelerated Cleanup Model (SACM) early actions and the long-term remedial strategy for this Site to minimize both the exposure to and migration of contaminants into the underlying aquifer. This memorandum is not a final Agency decision regarding the selection of a response action for the site.

The EE/CA for the proposed NTCRA at the Nuclear Metals Superfund Site will be performed by the PRPs contractor with oversight by EPA. Therefore, federal funds for the performance of an EE/CA are not requested at this time. This is a PRP-lead site. In addition, EPA anticipates that performance of the non-time critical removal action would also be performed as a PRP-lead action.

II. Background

A. Site Description and History

The Nuclear Metals Superfund site is in Concord, Massachusetts. The company was formerly called Nuclear Metals, Inc, until 1997 when the company changed its name to Starmet. The 46-acre site is zoned light industrial and is surrounded by light commercial and residential properties and is part of the watershed drained by the Assabet River, which passes the site about 300 feet from its northern boundary. Bordering the site to the north is Main Street (Route 62), as well as commercial and residential properties, to the east and south is woodland and residential properties, and to the west is woodland and commercial and industrial properties. The site was originally purchased in August 1957, and has been occupied since March 1958.

The NMI site is situated at an elevation some 20 to 30 feet above the Assabet River, and has irregular topography consisting of a number of natural depressions, or "kettles", some of which are occupied by wetlands. Three of these depressions, each of which is located to the east of the five inter-connected NMI facility buildings, have historically been used as disposal areas: the holding basin, the sphagnum bog, and the cooling water recharge pond. The site was used for disposal of wastes, including wastes containing hazardous substances, from approximately 1958 to 1985. The plant was initially used for research and development activities under a succession of owners and operators. Manufacturing of depleted uranium and beryllium products started in the mid-sixties under the regulatory authority of the Nuclear Regulatory Commission (NRC). The production of depleted uranium products resulted in the discharge of by-products from the processes to an on-site unlined holding basin. These by-products include, but are not limited to: depleted uranium, copper, nitric acid, and lime. Volatile organic compounds (VOCs) used as solvents and degreasers were also discharged through floor drains to an on-site cooling water pond, resulting in contamination of an on-site supply well. For a brief time during the start of operations at the NMI plant, contaminated liquids and sludges from the holding basin were piped into the sphagnum bog.

Samples taken from the site indicate the presence of depleted uranium, polychlorinated biphenlys (PCBs), VOCs, extractable petroleum hydrocarbons (EPH), copper, beryllium, lead, and arsenic, and many other hazardous substances. Soil is contaminated with depleted uranium, copper, beryllium, lead, arsenic, and EPHs. Groundwater is contaminated with depleted uranium, nitrate, and VOCs. Surface water contamination exists in the on-site cooling water recharge pond (CWRP) where elevated depleted uranium and copper concentrations have been detected. Sediments in an on-site bog and the CWRP are contaminated with depleted uranium, PCBs and copper.

MADEP involvement in the site began in 1980 when an on-site potable water supply well was found to be contaminated with VOCs during a study of regional groundwater quality. It was determined that the facility floor drains were discharging to the cooling water recharge pond and the supply well was pulling in VOC-contaminated groundwater via the recharge pond. The floor drains were subsequently sealed in 1980. On recent site visits to the facility, EPA has noticed some floor drains that do not appear to be sealed, and appear to be collecting liquids that are spilled on the facility floor.

On February 12, 1988, MADEP issued a Notice of Responsibility (NOR) to NMI concerning the site. The NOR required NMI to provide a compilation, interpretation, and assessment of all environmental data concerning the site to MADEP; report on the status of and closure plan for the holding basin; and evaluate the need for a more extensive evaluation of the site. At the same time MADEP required investigations were underway, the NRC requested that a characterization report for the holding basin be prepared to

support the decommissioning of the holding basin, and a report was subsequently submitted to the NRC in February 1993. The report stated that the sludge in the holding basin contained approximately 400,000 pounds of depleted uranium (DU) and approximately 700,000 pounds of copper. The initial volume of the holding basin sludge and soils requiring removal based on NRC release criteria was estimated to be approximately 9,000 cubic yards. Before the excavation of the holding basin could be initiated, however, the NRC delegated its regulatory authority to the state of Massachusetts, and in 1997, MADPH-RCP assumed regulatory authority over Starmet's radioactive materials license for the radioactive material operations at the facility.

In 1997, Starmet, with MADEP and MADPH-RCP oversight, performed an initial excavation of 8,000 cubic yards of uranium-contaminated soil and sludge from the holding basin, which was disposed of at an off-site disposal facility licensed to accept low-level radioactive waste. The cleanup of the holding basin halted when Starmet determined that the cleanup level set by MADEP could not be met without excavating significantly more material, and funds that the Army provided under an "extraordiary" contractural relief decision in 1996, had been depleted due to increased disposal costs of the uranium and copper contaminated soils and sludges. Starmet's lack of progress and the limited resources of MADEP to handle a cleanup with state funds prompted DEP to request that the Starmet facility be listed on the National Priorities List, making it a Superfund site under federal authority. The NMI site was listed on the NPL in June 2001, with concurrence from the Governor of Massachusetts.

In May 2001, Starmet transferred approximately 1,700 drums of depleted uranium from its South Carolina facility to the Site. An inventory of stored drums revealed that approximately 3,800 drums and other containers of depleted uranium and hazardous materials were stored within the facility. Given Starmet's poor financial condition, in February 2002, EPA, MADPH-RCP, MA DEP, and the Town of Concord Police and Fire Department entered into a Multi-Agency Contingency Plan to address emergency response coordination at the site. Under this plan, the MADPH-RCP agreed to provide site security in the event that Starmet abandoned the site. (The MADPH-RCP has funds available for the provision of site security as a result of accessing Starmet's $750,000 letter of credit, which was part of the financial assurance required for Starmet's radioactive materials license.) After Starmet indicated that it planned to cease operations or file for bankruptcy, the state obtained a preliminary injunction on January 25, 2002, requiring Starmet to maintain security and necessary utilities to ensure the safe maintenance of the stored drums. On March 15, 2002, Starmet was placed into temporary receivership by court order. On or about March 18, 2002, Starmet abandoned the Site property. The court receiver provided security and necessary utilities, with the assistance of MADPH-RCP, until, in April 2002, Starmet filed for Chapter 11 bankruptcy protection, returned to the facility, and resumed operations on a limited basis. In December 2002, Starmet's bankruptcy petition was dismissed by the Bankruptcy Court.

Starmet and several related entities continue to operate at the site and provide site security. Although Starmet continues to be licensed by MADPH-RCP, it is prohibited from engaging in activities involving manufacturing or production with radioactive materials. As indicated above, in May 2007, MADPH-RCP and Starmet entered into a Consent Decree under which Starmet has agreed to permanently vacate the Site

As part of the Preliminary Investigation/ Site Assessment (PA/SI), interviews of former employees, review of the site files, and geophysical surveys were conducted by EPA. Two discrete buried drum areas were identified from test pitting investigation conducted as part of the PA/SI. An Action Memorandum was signed in April 2002 authorizing the expenditure of federal funds for various removal activities, including: installation of a permanent fence around the buried drum area where local residents and a summer camp had direct access; capping of beryllium-contaminated soils overlying the same buried drum area; and lining of the holding basin with a temporary cover. The other buried drum area was already fenced and did not present an immediate risk to human health and the environment. This time-critical removal action work was completed in April 2003.

EPA signed an Administrative Order by Consent (AOC) on June 13, 2003 with three private parties, Whittaker Corporation, Textron, Inc., and MONY Life Insurance, and two federal parties, U.S. Army and U.S. Department of Energy, for the performance of a Remedial Investigation/Feasibility Study. Areas of concern at the site being addressed under the RI/FS include but are not limited to: a cooling water recharge pond, a sweepings pile, leachate septic systems, a sphagnum bog, and contaminated on-site soils surface water, and sediments.

Information collected from these various studies will be used in developing the EE/CA.

B. Nature and Extent of Contamination

As described above, several investigations have been performed and others are on-going at the site. Levels as high as 87,000 ug/l uranium have been detected in groundwater monitoring wells on site. Groundwater monitoring results to date indicate that uranium-contaminated groundwater is still within site boundaries, which is believed is due in part to the slow movement of uranium once it reaches the groundwater. Groundwater is not being used as drinking water source and all residences are connected to public water supply, however, the on-site aquifer is classified as a potentially productive aquifer. Discharge of contaminated groundwater and contaminated surface water runoff has the potential to reach the Assabet River, which is located approximately 300 feet downgradient from the site boundary.

The fencing and capping of the buried drum area and the lining of the holding basin has limited direct human exposure to contaminated surface soil and slowed the continuing

migration of contamination into the groundwater. Both the holding basin and the other buried drum area have been fenced for many years to limit the direct contact threat from high levels of uranium in the holding basin. As part of the RI/FS investigations, the buried drums next to the holding basin were removed to determine the nature and extent of contamination in this area and the area of the cooling water recharge pond. These buried drums and associated soils were shipped off site for disposal. The contaminated sub-surface soil in the saturated zone directly underneath the holding basin contains up to 650 mg/kg uranium, and as a result of the capping, the source of contamination to the groundwater will be reduced. Surface soils throughout the site contain an average of 50-100 mg/kg uranium, and drainage pipes from the facility to the holding basin have contributed to subsurface soil contamination upwards of 1,000 mg/kg uranium. Total EPH samples collected underneath the foundation of the facility were found to reach levels as high as 100,000 mg/kg. VOC groundwater contamination has decreased from the sealing of certain floor drains to almost non-detect from a high of 9,800 ug/l trichloroethane in 1980; however, a full assessment of VOC migration off-site has not been completed to date.

Due to the historical lack of maintenance of the drain lines from the facility, it is believed that substantial contamination exists under the facility foundation, and with the large amount and size of the equipment and machinery in the facility, sub-slab investigations will be difficult if not impossible without the removal of the equipment and machinery from the facility. Large cracks exist within the facility foundation as well, providing a conduit for contamination within the facility to reach the subsurface. The facility buildings are severely contaminated with depleted uranium and other hazardous substances. Contamination levels on the floors and walls of the facility range from 4,000 dpm/100cm^2 to over 4,000,000 dpm/100cm^2. MADPH's unrestricted release criteria of 10 mrem/yr equates to a residual surface contamination level of approximately 40dpm/100cm^2. High levels of contamination are also found on the roof of the facility building.

The facility buildings are in a state of disrepair, including but not limited to: contaminated roofs that are severely leaking in all of the five interconnected buildings, water from the roofs of the buildings coming into contact with poorly maintained electrical wiring, contaminated floors, and equipment; the presence of contaminated equipment remaining within the facility; and a fire suppression system that has not been fully tested despite the fire department's requests. A small fire occurred at the facility on June 26, 2007. There are also many miscellaneous containers of flammable and hazardous substances present in the building containing hydrofluoric acid, sulfuric acid, hydrochloric acid, acetone, sodium hydroxide and other substances. EPA expects to remove the miscellaneous containers from the site as part of a time-critical removal action, unless the Concord Fire Department is able to ensure that these containers are removed from the site without EPA assistance.

Finally, after Starmet vacates the site, there will be no security guards present at the site as well as no one operating the vital on-going building systems, including the electrical system needed for the fire alarm; the heating system to prevent ice from accumulating on the deteriorating roofs of the buildings; and the sonodyne system which treats contaminated water collected from within the building.

III. Threat to Public Health, Welfare, or the Environment

Section 300.415(b)(2) of the National Contingency Plan (NCP) lists a number of factors for EPA to consider in determining whether a removal action is appropriate, including:

> (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;
>
> (ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
>
> (iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;
>
> (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;
>
> (v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;
>
> (vi) Threat of fire or explosion;
>
> (vii) The availability of other appropriate federal or state response mechanisms to respond to the release; and
>
> (viii) Other situations or factors that may pose threats to public health or welfare or the environment.

An evaluation of the conditions at the Nuclear Metals Superfund Site conclude that factors (I), (ii), (iii), (iv), (v), and (vii) are applicable as described below.

(I) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants -

High levels of uranium and beryllium contamination have been found within deteriorating roof-

top ventilation equipment and on the surfaces of the buildings and their contents. Currently, runoff from the highly contaminated roofs is untreated and drains directly into the cooling water recharge pond, which has levels upwards of 200 mg/kg of uranium in the sediment. Further deterioration of the roofs and other structural components of the buildings or unauthorized or unintentional (e.g. tracking out on clothing or shoes) removal of contaminated materials could potentially expose nearby human populations, animals, or the food chain through contaminant migration. In addition, if access to the buildings and their contents is not sufficiently restricted, this could result in exposure to the human population from hazardous substances including radioactive waste should they come into contact with these materials or if these materials are intentionally or unintentionally removed from the site. Animals (such as mice, rats, raccoons and birds) also may come into contact with hazardous substances, including radiological waste, at the site.

(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems -

There is the potential for releases from within the buildings to an existing network of drain lines or to sub-slab soils through floor cracks could affect groundwater. It is likely that unsealed cracks in the facility floors and sumps in the foundation have been pathways for migration of the contamination into the groundwater. Site groundwater is contaminated at levels exceeding the MCLs. In addition, precipitation runoff from the highly contaminated roof ventilation systems could potentially further contaminate the groundwater. Although the nearby residents are connected to local water supplies, the underlying aquifer is a potentially productive aquifer, and has been contaminated with depleted uranium and other hazardous substances due to the operational practices at the facility.

The sphagnum bog, and on- and off-site wetlands represent a sensitive ecosystem at the site. Numerous media in this ecosystem have been affected by contamination: sediment, surface water, soil, and wetland areas. Although an ecological risk assessment has not yet been conducted at the site, numerous birds and animals have been observed at the site by EPA. These ecological receptors would likely be damaged by exposure to the types of hazardous substances found within the facility buildings.

(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release -

Although the MADEP has removed more than 3800 drums and containers of depleted uranium, there are still numerous containers, tanks, and miscellaneous equipment that are contaminated with depleted uranium, beryllium and other hazardous substances. Two examples of this are as follows: in building C, a concrete pit is located beneath a 1400 ton extrusion press, and contains an estimated 10,000 gallons of liquid, which consists of water collected from the leaking roof, waste oil, and depleted uranium sludge; and, building E contains numerous above ground storage tanks that contain approximately 20,000 gallons of used machine coolant presumed to be

contaminated with depleted uranium. Beryllium waste drums are currently being stored in building E as well, however, it is unknown whether the current operators of the facility intend to dispose of this waste or abandon it in place. Given the deteriorating condition of the buildings, these materials may pose a threat of release. Numerous small containers of flammable liquids are also present throughout the buildings, posing an increased fire risk. The widespread storage of flammable liquids poses an increased fire risk that also may lead to a catastrophic release of some or all of the hazardous substances. Although EPA currently expects to remove these containers from the site as part of a time-critical removal action, the containers are present at the site at this time.[1]

(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate -

Initial survey results confirm that certain areas of the concrete floors have high levels of radiological contamination (i.e., two readings of the floor in building D were 1,690,000 dpm/100cm^2 and 3,326,000 dpm/100cm^2 compared to MADPH's criteria of 40 dpm/100cm^2 for unrestricted release). This suggests that there is a high potential for the underlying soil to become impacted. The foundation covers most of the contaminated soils underneath the building. However, there is a potential for mobility of the contamination within the buildings into the sub-slab soils due to rainwater infiltration into many of the buildings through the deteriorating roofs, and the numerous cracks in the foundation promote the migration of these contaminants into the sub-slab soils. Migration of uranium and other hazardous substances is also evidenced by a long-term groundwater monitoring program that shows continued contamination of on-site groundwater.

(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released -

The buildings are in deteriorated condition, with numerous roof leaks and areas of the roof that are decayed to such an extent that they cannot be accessed due to the potential for breakthrough. Highly contaminated ventilation systems are on the roofs, so that collapse or material degradation could lead to release and/or migration through roof drains to wetlands and /or into the underlying soils and groundwater. A roof evaluation that was performed in 2004 determined that a lack of maintenance for a protracted period could lead to sufficient deterioration that collapse or partial collapse of roofs/buildings is possible. In addition, runoff of water that comes into contact with the contaminated roof ventilation systems likely leads to the further spread of contamination to

[1] No action memo has been issued as yet, although EPA has issued notice letters to the PRPs, inviting them to remove the flammable and hazardous materials from the site.

the cooling water recharge pond, where runoff water is discharged.

(vi) Threat of fire or explosion-

There are flammable liquids (numerous small containers located throughout the facility and in the facility's two laboratories), and gas cylinders located throughout the facility. EPA currently expects to remove these containers from the site as part of a time-critical removal action, as stated above. In addition, there are large volumes of combustible material (hundreds of boxes filled with historical documents), and equipment such as the centerless grinder, as well as other equipment, that may contain depleted uranium powders and sludge, which may become pyrophoric if it is divided finely and completely dries out. Therefore, a risk of fire at the site exists, which is further exemplified by the fire that occurred on June 26, 2007.

(vii) The availability of other appropriate federal or state response mechanisms to respond to the release -

Funding for the RI/FS is available per an Administrative Order by Consent (AOC) with two private parties and the U.S. Army and the U.S. Department of Energy. EPA does not expect to expend federal funds for this EE/CA as this EE/CA will be performed by the PRPs pursuant to the RI/FS AOC, signed on June 13, 2003. EPA also expects to negotiate with the PRPs for the performance of the NTCRA. Due to the potential high costs associated with the NTCRA, there are likely no state response mechanisms available with sufficient funding to perform a non-time critical removal action to respond to the threat posed by the facility buildings. The MADPH-RCP does have some monies recovered from Starmet's letter of credit which was part of the financial assurance required for Starmet's radioactive materials license, however, those funds are less than $750,000, and will not be sufficient to address any alternatives proposed in the EE/CA. Thus, CERCLA authority appears to be the only appropriate available mechanism to respond to this release.

(viii)Other situations or factors that may pose threats to public health or welfare or the environment -

A large quantity of PCB-containing ballasts and transformers are located within the building. PCBs have been detected in media outside of the buildings in areas where floor drains are known to have discharged. The presence of PCB containing materials within the buildings, and significant concentrations at drain discharges suggests that building drain lines will also contain PCBs. In addition, as mentioned above, the facility buildings also represent a fire and explosion risk, as evidenced by a small fire that occurred at the facility on June 26, 2007. Furthermore, the facility is in a state of disrepair, and severely leaking contaminated roofs coming into contact with poorly maintained electrical wiring, contaminated floors, and equipment as well flammable and combustible hazardous materials remaining within the facility pose a significant threat to public health or welfare or the environment.

Based upon the NCP factors previously listed, a current or potential threat exists to public health or welfare or the environment due to the release or threat of release of hazardous substances into the environment. A NTCRA is therefore appropriate to abate, prevent, minimize, stabilize, mitigate, or eliminate such threats. In particular a NTCRA is necessary to remove, control or contain the risk from the potential exposure to the release of hazardous substances from the Site. The NTCRA will remove, control or contain the risk of potential exposure to contaminated materials within, and releasing from, the facility.

This removal is designated as non-time critical because more than six months planning time is available before on-site activities must be initiated. Prior to the actual performance of a non-time critical removal at this Site, Section 300.415(b)(4) of the NCP requires that an engineering evaluation/cost analysis (EE/CA) be performed in order to weigh different response options.

IV. Endangerment Determination

There may be an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the site.

V. Scope of the EE/CA(s)

The purpose of the EE/CA(s) will be to evaluate alternatives for response measures to the contaminated soil and buried drums at the site. The EE/CA will consider alternatives which meet the following general removal action objectives:

* Prevent, to the extent practicable, human exposure to contaminated equipment and materials in the facility, or releasing into the environment from the facility. The greatest threat of release is in the event of a fire or a partial or complete roof collapse;

* Prevent, to the extent practicable, the risk of fire to existing building structures and their contents;

* Prevent, to the extent practicable, direct contact with, ingestion of, and inhalation of contaminants present within the buildings by trespassers or other humans that may become exposed to contaminants within the building as a result of a fire or roof collapse.

Pursuant to EPA guidance on EE/CAs, alternatives will be evaluated based upon effectiveness, implementability, cost and compliance with ARARs to the extent practicable. The alternatives that will be proposed in the EE/CA range from monitoring and access controls (i.e., site security) to removal contaminated equipment and hazardous materials from the facility buildings and demolition of the buildings. Demolition of the buildings would not include the removal of concrete slabs and foundations within the buildings --slabs and foundations would remain in

place so as not to disturb potentially-contaminated underlying soil and a temporary cap would be installed over the slabs to inhibit rainwater infiltration while the sub-slab soils are investigated as part of the RI/FS. It is estimated that any alternatives to address contamination within the facility other than no action will exceed $2 million dollars and therefore they will be evaluated to determine their consistency with future remedial actions to be taken at the Site. It is important to note that the buildings are in a state of disrepair and, in all probability, will require demolition, if not under a NTCRA, then under the final remedial action for the site. Further information regarding the consistency of the NTCRA with future remedial actions at the site is discussed in section VIII, below.

In developing the range of alternatives to be evaluated in the EE/CA, EPA will consider 300.415(d) of the NCP as well as relevant guidance.

VI. Enforcement Strategy

As indicated above, the EE/CA will be performed by the Respondents pursuant to an Administrative Order by Consent for performance of an RI/FS and EE/CA(s), which became effective on June 13, 2003. This is a PRP-lead site. EPA anticipates that performance of the non-time critical removal action would be performed on a PRP-lead basis.

VII. Estimated Costs

Costs associated with the preparation of the EE/CA(s) described above, including community relations activities and development of an Administrative Record, are expected to be approximately $500,000, and are being paid for by the PRPs under the existing RI/FS agreement. Based upon preliminary PRP estimates, costs associated with the most expensive option for the complete removal of the buildings' contents and demolition of the facility is estimated to be in the range of $60 to $65 million. Another option would consider removal of the contaminated equipment from the buildings and stabilization of the facility for later demolition, at a cost of approximately $39 million. Removal of the concrete slabs and foundations is not part of the scope of the EE/CA. These costs could be significantly impacted positively or negatively by the volume of material and/or equipment that may require disposal as radioactive or mixed waste.

The EE/CA for the proposed NTCRA at the Nuclear Metals Superfund Site will be performed by the PRPs contractor with oversight by EPA. Therefore, federal funds for the performance of an EE/CA are not requested at this time. This is a PRP-lead site. EPA anticipates that performance of the non-time critical removal action would be performed on a PRP-lead basis.

VIII. Other Considerations

The proposed NTCRA is consistent with the anticipated remedial actions to minimize exposure to and migration of contaminants. The data collected to date by the removal and remedial

programs documents that the nature of the threat at the site requires a remedial response consistent with the proposed NTCRA(s).

The proposed NTCRA is one part of a phased approach to address concerns at the Nuclear Metals Superfund Site. The other components are (1) a time-critical removal action conducted in 2002 including: installation of a permanent fence around an area containing buried drums where local residents and a summer camp had direct access; capping of beryllium-contaminated soils overlying the same buried drum area; and lining of the holding basin with a temporary cover; (2) a MADEP removal action that has addressed the 3,800 stored drums and containers of depleted uranium in the facility through an agreement reached with the U.S. Army; and (3) the five-year phased RI/FS which will fully characterize the site, followed by implementation of the selected remedy. In response to the recent fire, EPA currently expects to perform a time-critical removal action for certain flammable and hazardous materials currently being stored within the buildings.

The State of Massachusetts supports an early action at this site.

IX. Headquarters Consultation

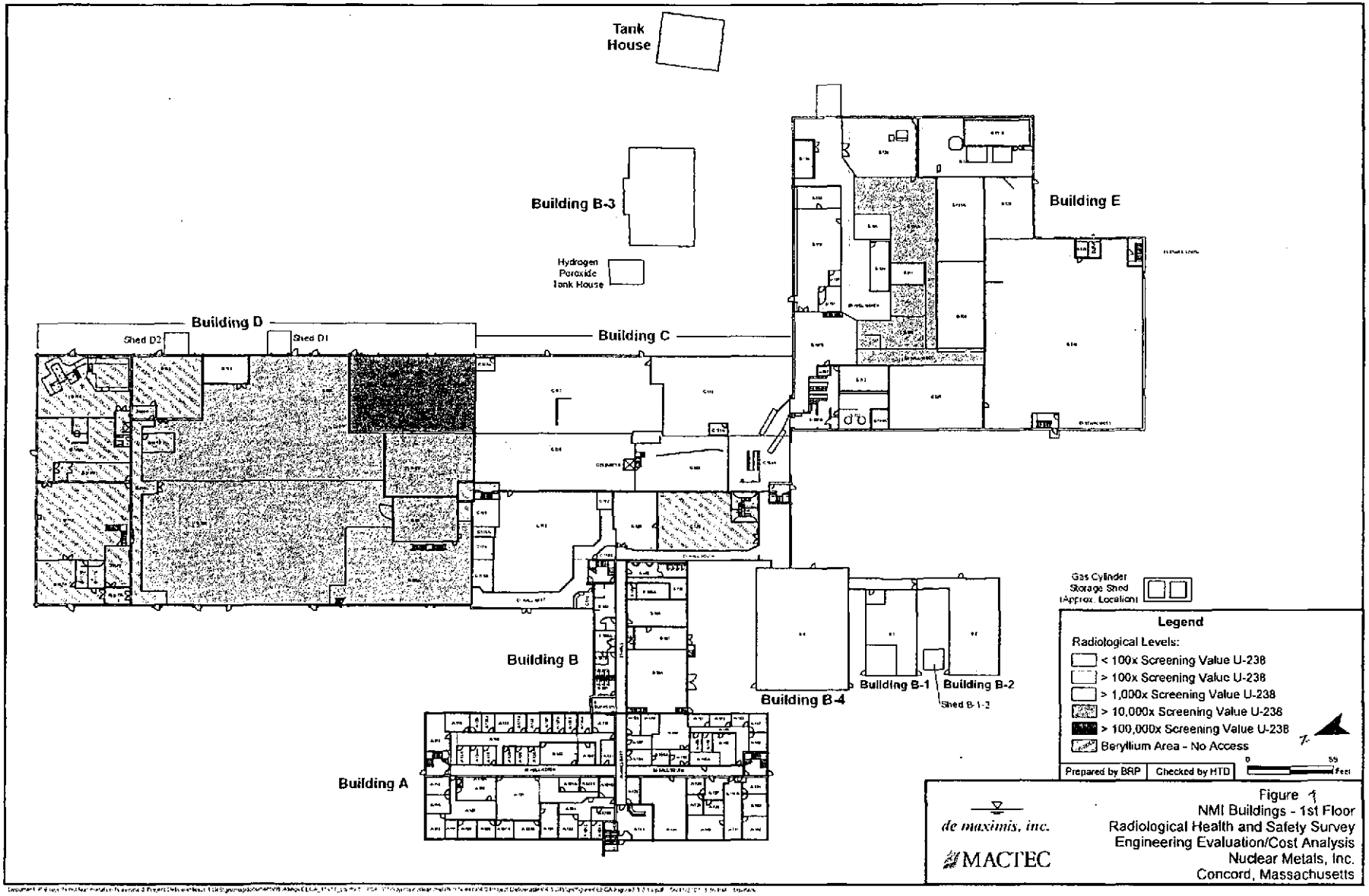
In accordance with the national guidance document "Use of Non-Time Critical Removal Authority in Superfund Response Actions", dated February 14, 2000, EPA Region 1 has consulted with the Office of Superfund Remediation and Technology Innovation (OSRTI) and the Office of Emergency Management (OEM) based on the anticipated cost of the NTCRA being greater than $6 million. Furthermore, due to the potential high cost of the NTCRA, the National Remedy Review Board reviewed the preliminary options and costs for performing a NTRCA, and provided recommendations to EPA Region 1 in the spring 2007.

X. Recommendation

Ongoing investigations have determined that there has been a release of hazardous substances to the environment. Additionally, the conditions at the site meet the NCP Section 300.415(b) criteria for a removal. Consistent with Section 104(b) of CERCLA and NCP Section 300.415(b)(4), further investigation is necessary to plan and direct the future removal action. We recommend your approval of this request to perform an EE/CA at the Nuclear Metals Superfund Site. The total estimated cost the PRPs will incur for performing the EE/CA is $500,000.

12/12/07
Date

for James T. Owens III, Director
Office of Site Remediation and Restoration


Tank House
Building B-3
Hydrogen Peroxide Tank House
Building E
Building D
Shed D2
Shed D1
Building C
Building B
Building B-4
Building B-1
Building B-2
Shed B-1-2
Building A
Gas Cylinder Storage Shed (Approx. Location)
Legend
Radiological Levels:
< 100x Screening Value U-238
> 100x Screening Value U-238
> 1,000x Screening Value U-238
> 10,000x Screening Value U-238
> 100,000x Screening Value U-238
Beryllium Area - No Access
Prepared by BRP
Checked by HTD
0
55
Feet
de maximis, inc.
MACTEC
Figure 1
NMI Buildings - 1st Floor
Radiological Health and Safety Survey
Engineering Evaluation/Cost Analysis
Nuclear Metals, Inc.
Concord, Massachusetts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

DEC - 7 2007

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Engineering Evaluation/Cost Analysis Approval Memorandum for the Nuclear Metals Incorporated Superfund Site

FROM: James E. Woolford, Director
Office of Superfund Remediation and Technology Innovation (OSRTI)

TO: James T. Owens III, Director
Office of Site Remediation and Restoration
U.S. EPA Region 1

Purpose

OSRTI has reviewed and concurs with the Region I decision to proceed with an Engineering Evaluation/Costs Analysis for a non-time critical removal action at the Nuclear Metals Incorporated Superfund Site in Concord, Massachusetts.

If you have any questions, please feel free to contact me or have a member of your staff contact Rafael Gonzalez at (703) 603-8892.

cc: Rafael Gonzalez, OSRTI
Larry Brill, Region 1
Bob Cianciarulo, Region 1

DELIVER TO:

BOB CIANCIARULO

APPENDIX B
REMEDY REVIEW BOARD RECOMMENDATIONS AND EPA REGION 1 RESPONSES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

May 30, 2007

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Nuclear Metals Superfund Site

FROM: David E. Cooper, Chair
National Remedy Review Board

TO: James T. Owens, Director
Office of Site Remediation and Restoration
U.S. EPA Region 1

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Nuclear Metals Superfund Site in Concord, Massachusetts. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator announced the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board evaluates the proposed actions for consistency with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and relevant Superfund policy and guidance. It focuses on the nature and complexity of the site; health and environmental risks; the

range of alternatives that address site risks; the quality and reasonableness of the cost estimates for alternatives; regional, state/tribal, and other stakeholder opinions on the proposed actions, and any other relevant factors.

Generally, the Board makes advisory recommendations to the appropriate regional decision maker. The Region will then include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the Region is expected to give the board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the Region's final decision. The Board expects the Regional decision maker to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. It is important to remember that the Board does not change the Agency's current delegations or alter in any way the public's role in site decisions.

Overview of the Proposed Action

The Nuclear Metals, Inc. (NMI) Superfund Site encompasses 46.4-acres and includes eight interconnected buildings, several smaller outbuildings, paved parking areas, a cooling water recharge pond, a former waste holding basin, a bog, and areas of fill and/or waste materials. The proposed action the Board reviewed included only the interconnected buildings. Operations at the Site included metallurgy research and development, large-scale production of depleted uranium (DU) shields and armor penetrators, metal powders, beryllium and beryllium alloy parts production, and manufacture of specialty titanium parts. Much of the operations at the site were conducted under contracts with the United States Atomic Energy Commission and the United States Department of Defense. Starmet's (NMI's new name) radioactive materials operations have historically been regulated under a radioactive materials handling license from the Massachusetts Department of Public Health's Radiation Control Program (MADPH-RCP), under authority delegated from the U.S. Nuclear Regulatory Commission (NRC).

The Engineering Evaluation/Cost Analysis (EE/CA) under consideration by the Board was developed while a Remedial Investigation/Feasibility Study (RI/FS) is in progress for the Site. CERCLA requires that any removal action taken be consistent with the long term remedial action for the Site. In this case, given the decommissioning requirements that must be met (*MADPH-RCP unrestricted release clean up standard of 10 mrem/yr Total Effective Dose* Equivalent (TEDE) under 105 CMR120.245), it is assumed that the buildings will eventually be demolished. This EE/CA evaluates specific hazards associated with Site buildings and their contents and measures to address these hazards. The Region is proposing a non-time critical removal action for demolition and off-site disposal of the contaminated buildings and their contents at an estimated cost of approximately $77 million. Under the preferred alternative, the following would be done:

a) Strip off removable radiological contamination from select surfaces to minimize waste volumes to be disposed as low-level radioactive waste using one or more of the methods discussed below.

b) Cap and/or clean existing drain lines, vaults, and sumps;
c) Demolish structures and buildings;
d) Off-site disposal of removed materials, as appropriate; and,
e) Fill voids and temporarily cap building slabs, pending a future remedial action to address building slabs and impacted sub-slab soil.

NRRB Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Melissa Taylor, Bob Cianciarulo, Larry Brill, and Audrey Zucker from EPA Region 1 and Jay Naparstek and Paul Craffey from Massachusetts Department of Environmental Protection on April 10, 2007. Based on this review and discussion, the Board offers the following comments:

1. The materials presented to the Board suggest that some site conditions may pose imminent risks. The Board recommends that the Region consider whether the contemplated timetable for taking response actions at this site is consistent with the urgency posed by the specific circumstances (e.g., fire and electrocution hazard posed by electrical power circuits still in use throughout the buildings with leaking roofs, pyrophoric contaminants, combustible building materials). The Region should explain its conclusions in the decision documents.

2. The package presented to the Board did not include a consideration of on-site disposal. The Board recommends that the Region include a discussion of how options for on-site temporary staging and/or disposal of demolition waste and debris were considered when assembling the alternatives presented in the engineering evaluation/cost analysis (EE/CA). The discussion should reflect technical considerations, applicable or relevant and appropriate requirements (ARARs) and local/State perspectives. The decision documents should also be explicit how the disposal option in the preferred alternative would meet the NCP program management principle to be "not-inconsistent with...the expected final remedy" (§300.430(a)(1)(ii)(B)).

3. The Board notes that this high cost response action is being planned as a non-time-critical removal action (NTCRA) under CERCLA authority. The Region should address how this NTCRA is consistent with the NCP provisions addressing removal actions, and how it will be consistent with the follow-on remedial action as provided in CERCLA Section 104(c). The Board also notes there are several potentially relevant guidance documents, including but not limited to "Use of Non-Time-Critical Removal Authority in Superfund Response Actions" (Feb. 14, 2000) (EPA's policy on consultation with EPA Headquarters on removal actions with costs greater than $6,000,000) and "Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)," U.S. Department of Energy and U.S. Environmental Protection Agency, (May 22, 1995). The Board supports the Region's plan to conduct community involvement activities for this action that are substantially equivalent to those used for remedial actions.

4. The Nuclear Metals facility contains many non-radioactive contaminants, both as contents of the buildings and as part of the building structures, which could be released if there were a fire or collapse of a building. However, the objectives for the removal action presented to the Board did not include objectives for these non-radiological risks. The Board recommends that the Region consider the possibility of adding objectives for non-radiological risk, including the risks associated with depleted uranium (DU), asbestos, and beryllium, based on currently available information.

5. The Board notes that the 10 mrem/yr removal goal is based on ARARs for building demolition during decommissioning radioactive sites, irrespective of future land use (Massachusetts Regulations for the Control of Radiation, Radiological Criteria For Unrestricted Use: 105 CMR 120.245). The Board recommends that the decision documents clarify that the use of the 10 mrem standard for building demolition does not presuppose land use assumptions for future actions at the site. The decision documents should also clarify the relationship among future land use assumptions, removal objectives, and ARARs, and their roles in establishing removal goals.

6. The Board notes the elevated beta and alpha disintegrations per minute (dpm) count levels as reported in the package. The count levels (dpm) are higher than for depleted uranium (DU) alone. The Board recommends that the Region refine the waste characterization for this removal action to include both chemical and radiological analysis (e.g., isotopic, gamma spectrometry). This information may be critical with regard to worker safety during the action and selection of appropriate (and least costly) commercial disposal options.

The Board appreciates the Region's efforts in working together with the potentially responsible parties, State, and community groups at this site. We request that a draft response to these findings be included with the draft Proposed Plan when it is forwarded to your OSRTI Regional Support Branch for review. The Regional Support Branch will work with both me and your staff to resolve any remaining issues prior to your release of the Proposed Plan. Once your response is final and made part of the site's Administrative Record, then a copy of this letter and your response will be posted on the Board website (http://www.epa.gov/superfund/programs/nrrb/).

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 603-8763 should you have any questions.

cc: J. Woolford (OSRTI)
E. Southerland (OSRTI)
S. Bromm (OSRE)
J. Reeder (FFRRO)
R.Gonzalez (OSRTI)
NRRB members

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 Congress Street, Suite 1100
BOSTON, MA 02114-2023

Memorandum

Date: January 29, 2008

Subject: Responses to National Remedy Review Board (NRRB) Recommendations for the Non-Time Critical Removal Action for the Nuclear Metals, Inc. Superfund Site

From: Melissa Taylor, Remedial Project Manager
Nuclear Metals, Inc. Superfund Site

Through: Bob Cianciarulo, Chief
Massachusetts Superfund Section

Mike Jasinski, Region I Representative
National Remedy Review Board

To: David E. Cooper, Chair
National Remedy Review Board

EPA Region I has reviewed the recommendations of the National Remedy Review Board (NRRB) for the Nuclear Metals, Inc. Superfund Site (Site), as were documented in a memorandum dated May 30, 2007. Region I appreciates the Board's input and will incorporate the Board's recommendations into the Engineering Evaluation/Cost Analysis (EE/CA) and Action Memo, as appropriate. Specific responses to each of recommendation are outlined below. The NRRB's recommendations are in ***bold italics*** followed by the regional response.

Recommendation #1:

The materials presented to the Board suggest that some site conditions may pose imminent risks. The Board recommends that the Region consider whether the contemplated timetable for taking response actions at this site is consistent with the urgency posed by the specific circumstances (e.g., fire and electrocution hazard posed by electrical power circuits still in use throughout the buildings with leaking roofs, pyrophoric contaminants, and combustible building materials). The Region should explain its conclusions in the decision documents.

The region continues to work with local officials, especially the Town's Fire Chief, to evaluate and address fire risks at the facility. A small fire broke out inside the Starmet plant in June 2007. Based, in part, on that event, EPA has conduced additional Removal Assessment activities to inventory and evaluate hazardous materials inside the building.

In September and again in October 2007, the Concord Fire Department (CFD) ordered Starmet to remedy certain potential fire hazards within the building. Due to Starmet's failure to fully comply with the orders, on November 21, 2007, the Fire Department wrote a letter to EPA requesting assistance to address the fire hazards in the building that were not addressed by Starmet. Based on the CFD's request for assistance, EPA issued an Action Memo on December 21, 2007 to conduct a Time-Critical Removal Action (TCRA) to deal with these materials. The TCRA began on January 7, 2008, and is expected to be completed by this spring.

Recommendation #2:

The package presented to the Board did not include a consideration of on-site disposal. The Board recommends that the Region include a discussion of how options for on-site temporary staging and/or disposal of demolition waste and debris were considered when assembling the alternatives presented in the engineering evaluation/cost analysis (EE/CA). The discussion should reflect technical considerations, applicable or relevant and appropriate requirements (ARARs) and local/State perspectives. The decision documents should also be explicit how the disposal option in the preferred alternative would meet the NCP program management principle to be "not-inconsistent with...the expected final remedy" (§300.430(a)(l)(ii)(B)).

On site disposal was not initially evaluated as an alternative as it is unclear what materials may be disposed of on-site until further characterization of the materials is performed, as well as an evaluation if decontamination prior to on-site disposal is cost effective. The EE/CA has been revised to indicate that during the design of the NTCRA an evaluation of 1) whether on-site disposal is an option (either temporarily or permanently) for building materials that are not contaminated with radioactive or hazardous substances, or 2) if contaminated building materials can be decontaminated cost-effectively so that on-site disposal is the more viable option. As discussed with the RRB, the Region believes that this action is consistent with the final remedy for the site. The Action Memo will document that the disposal action in the preferred alternative will be consistent with the expected final remedy.

Recommendation #3:

The Board notes that this high cost response action is being planned as a non-time-critical removal action (NTCRA) under CERCLA authority. The Region should address how this NTCRA is consistent with the NCP provisions addressing removal actions, and how it will be consistent with the follow-on remedial action as provided in CERCLA Section 104(c). The Board also notes there are several potentially relevant guidance documents, including but not limited to "Use of Non-Time-Critical Removal Authority in Superfund Response Actions'" (Feb. 14, 2000) (EPA's policy on consultation with EPA Headquarters on removal actions with costs greater than $6,000,000) and "Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA}," U.S. Department of Energy and U.S. Environmental Protection Agency, (May 22, 1995). The Board supports the Region's plan to conduct community

involvement activities for this action that are substantially equivalent to those used for remedial actions.

As discussed with the Board, the Region believes that this action is fully consistent with any expected follow-on Remedial Action. To meet the consultation requirements of the applicable guidance, the EE/CA approval memo has been drafted and was sent to the appropriate headquarters offices, and a memo from OSRTI OD Jim Woolford was received on December 7, 2007, indicating that the Region met the HQ consultation requirements for this EE/CA.

Recommendation #4:
The Nuclear Metals facility contains many non-radioactive contaminants, both as contents of the buildings and as part of the building structures, which could be released if there were a fire or collapse of a building. However, the objectives for the removal action presented to the Board did not include objectives for these non-radiological risks. The Board recommends that the Region consider the possibility of adding objectives for non-radiological risk, including the risks associated with depleted uranium (DU), asbestos, and beryllium, based on currently available information.

The TCRA currently underway will address the majority of non-radiological risks from non-radiological materials should a fire or collapse of the building occur. Since it is difficult to fully determine what the risks are for non-radiological substances that could be embedded in the facility structures, the non-radiological risks from the building materials will be evaluated during the characterization phase of the NTCRA.

Recommendation #5:
The Board notes that the 10 mrem/yr removal goal is based on ARARs for building demolition during decommissioning radioactive sites, irrespective of future land use (Massachusetts Regulations for the Control of Radiation, Radiological Criteria for Unrestricted Use: 105 CMR 120.245). The Board recommends that the decision documents clarify that the use of "(t)he 10 mrem standard for building demolition does not presuppose land use assumptions for future actions at the site. The decision documents should also clarify the relationship among future land use assumptions, removal objectives, and ARARs, and their roles in establishing removal goals.

The draft EE/CA is currently being revised and this comment will be addressed in the final version of the EE/CA and ultimately in the planned Action Memo, as appropriate.

Recommendation #6:
The Board notes the elevated beta and alpha disintegrations per minute (dpm) count levels as reported in the package. The count levels (dpm) are higher than for depleted uranium (DU) alone. The Board recommends that the Region refine the waste characterization for this removal action to include both chemical and radiological analysis (e.g., isotopic, gamma spectrometry). This information may be critical with regard to worker safety during the action and selection of appropriate (and least costly) commercial disposal options.

During the "design" and implementation of the Removal Action, further characterization of contaminated materials will be done to ensure proper handling and disposal of these materials.

The Region would like to thank you and all of the Board members for your input and guidance on this important project. If you have any further questions or need additional information, please feel free to contact me at 617-918-1310 or via email at taylor.melissag@epa.gov.

APPENDIX C
RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

There has been extensive community participation during the Non-Time Critical Removal Action process for the Nuclear Metals Superfund Site. In advance of and during performance of this NTCRA, EPA's Community Involvement Office will disseminate information regarding the project to the impacted residents and local citizen groups. There are two very active community groups that EPA meets with bi-monthly to discuss technical issues at the Site, the town-appointed 2229 Main Street Advisory Committee and the Technical Assistance Grant recipient Group CREW (Citizens Research and Environmental Watch). EPA will continue to work closely with the Town, CREW, and state officials as the project progresses.

In April 2008, EPA issued a fact sheet to the local communities, seeking comments on the NTCRA proposal to demolish the site buildings. On May 15, 2008, EPA held a public meeting to discuss the alternatives in the EE/CA and discuss EPA's preferred alternative for the demolition of the facility buildings. From May 13th to June 12th, 2008 EPA held a public comment period. Outlined below is a summary of significant comments received from the public and other interested parties during the public comment period and EPA's response to those comments. Similar comments have been summarized and grouped together. The full text of all written comments received during the comment period has been included in the Administrative Record.

1. Several comments were received in support of EPA's proposed alternative, Alternative 5: Building Demolition with On-Site or Off-Site Disposal. Among those submitting comments in support of the proposal were the Town of Concord, the town's 2229 Main Street Committee, the Citizens Research and Environmental Watch (CREW), and several residents. No comments in opposition to EPA's proposal were received.

   EPA Response: EPA appreciates the support from the Town of Concord and its advisory committee, CREW, and various other members of the community. EPA recommends this alternative because it will remove the threat the facility presents and will allow further remedial action at the Site to move forward. The demolition and removal of the buildings is anticipated to be necessary under the long-term remedial action for the Site, and meets the objectives of contributing to the efficient performance of remedial activities.

2. A number of comments were received regarding the schedule for completing the proposed action, advocating for beginning this project as quickly as possible.

   EPA Response: EPA would also like to see this project start as quickly as possible. However, time is needed to negotiate with the Potentially Responsible Parties (PRPs) for the performance of the Non-Time Critical Removal Action (NTCRA), and once that is accomplished, various plans need

to be developed to perform the work. EPA hopes to initiate on-site NTCRA activities within nine months of reaching an agreement with the PRPs, and the work is estimated to take three to four years to complete.

3. A number of comments noted that the cleanup plan should also include surface (building slabs) and sub-surface (piping, pits, underground storage tanks) structures that serve the buildings.

   EPA Response: At this time, EPA has insufficient data to select an appropriate cleanup plan to permanently address the building slabs and the sub-surface beneath the facility buildings. Because limited access to sub-slab materials has restricted the investigation of what contamination lies beneath the foundation, EPA has determined that as part of the early stages of this NTCRA, a sub-slab investigation will be performed. The results of this evaluation will be considered, along with all other data collected for the Site, as part of a comprehensive final remedy for the Site. However, in order to temporarily address these areas as part of the NTCRA, voids, pits, sumps, and cracks in the foundation will be filled, and a temporary cover will be placed over the foundation to minimize surface water infiltration.

4. Several commenters expressed concerns over the overall investigation and cleanup schedule and requested an update on EPA's schedule for the selection of the final Site remedy. One commenter also asked for clarification on whether the scope of the investigation includes groundwater and the Assabet River.

   EPA Response: Although the remedial investigation has taken several years, such detailed investigation is necessary to determine the nature and extent of contamination at the Site. The Record of Decision (ROD) that will document the final remedial cleanup is targeted for the end of 2010. Furthermore, since the time EPA has become involved at the Site, numerous interim actions have taken place at the Site, including:

   i. From April 23, 2002 to April 30, 2003, EPA conducted a time-critical removal action that included the installation of a temporary cover system (cap) over the old landfill area, and the installation of a liner over the holding basin. In addition, a fence was erected around the old landfill area;

   ii. The Respondents under the Consent Order for the Remedial Investigation/Feasibility Study removed drums discovered during the 2002 time-critical removal action in December 2004 as part of the activities performed under the Consent Order;

   iii. In the spring of 2006, the Massachusetts Department of Environmental Protection ("MADEP") conducted a removal

action, with proceeds obtained by the State through a settlement with the U.S. Army, which consisted of the removal of more than 3,800 drums and containers containing depleted uranium from within the facility; and

iv. After a fire that occurred at the Site in June 2007, the Concord Fire Department sent a letter to EPA requesting assistance with removing these materials from the facility, concluding that the continued existence of these materials within the facility constitutes a threat to public health and safety. EPA began a time-critical removal action in early 2008 to remove hazardous and flammable materials from within the facility buildings. The expected completion date is fall 2008.

Finally, it should be noted that the scope of the ongoing investigation at the Site will include the groundwater underlying the Site and the Assabet River.

5. Comments were received asking about the source of funding for the planned action and the status of enforcement against potentially responsible parties (PRPs), including Starmet Corporation (Starmet) and other operating businesses inside the facility buildings.

EPA Response: Under an Administrative Order by Consent for Remedial Investigation/Feasibility Study, signed in 2003, and amended in 2008, two corporate PRPs (Whittaker Corporation and Textron Inc.) are currently performing the RI/FS at the Site, with significant funding by two federal PRPs (U.S. Army and U.S. Department of Energy). Shortly after the issuance of the Action Memorandum for the NTCRA, EPA expects to begin negotiations with these PRPs for the financing and performance of the NTCRA.

With respect to Starmet and its subsidiary Starmet NMI Corporation, the United States, on behalf of EPA, filed a lawsuit against these companies in federal district court on September 27, 2007, seeking reimbursement of cleanup costs for the Site. In connection with this lawsuit, EPA is also currently engaged in discussions with Starmet regarding its departure from the Site.

Finally, as indicated in the Action Memorandum for the NTCRA, in May 2007, the Massachusetts Department of Public Health Radiation Control Program (MADPH-RCP) and Starmet entered into a Consent Decree under which Starmet agreed to permanently vacate the Site by October 31, 2007. Starmet's related companies that are also operating at the Site were required to permanently vacate the Site on the same date. Starmet has not left the Site to date; however, it is in discussions with MADPH-RCP regarding its departure.

6. A number of comments asked for information on whether there are current risks from the Site posed to neighboring residential areas (via air, drinking water, or groundwater), what the risks would be during proposed demolition activities (including questions on what control measures will be implemented), and what the risks would be in the event of a fire prior to the demolition.

EPA Response: Current risks to the nearby residents posed by contamination in and on the buildings are considered negligible as contamination is largely contained within the building materials, and testing of ambient air at the Site boundary has not found detectable levels of contamination from the Site. Contaminants from the site buildings, however, could pose a risk to nearby residents in the event of a large scale fire or explosion, or if site security is not maintained and trespassers remove contaminated materials from the buildings. EPA is currently performing a time-critical removal action at the Site to remove containers of flammable and other hazardous substances from within the facility buildings. This action is designed to reduce the risk to nearby residents in the event of a fire prior to the building demolition. Site security, including an activated alarm system, will be maintained even after Starmet vacates the Site.

With respect to exposure to drinking water or groundwater, both the Town of Concord and the adjacent Town of Acton are on public water supplies that have not been impacted by site-contaminated groundwater. Moreover, groundwater flow at the Site is towards the Assabet River, which is the opposite direction of the adjacent residences

A full risk assessment for the entire Site will be performed as part of the ongoing RI/FS, but has not been completed to date because all of the data collection has not been completed.

Finally, during the performance of the NTCRA, the control measures that will be implemented include, but are not limited to: interior cleaning prior to demolition, ambient air monitoring and personal air monitoring, and dust suppression.

7. The Massachusetts Department of Public Health provided information on additional regulations that they believe may be pertinent to the cleanup plan.

EPA Response: The regulations that the Massachusetts Department of Public Health outlined are included in the Applicable or Relevant and Appropriate Requirements (ARARs) under Table 3-2 of the NTCRA "Potential Action-Specific ARARs and TBC." Specifically, the Massachusetts Regulations for the Control of Radiation (105 CMR 120) are considered applicable to this response action.

APPENDIX D
MADEP SUPPORT LETTER

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

September 11, 2008

Mr. Larry Brill, Branch Chief
Office of Site Remediation and Restoration
U.S. EPA Region 1
1 Congress Street
Suite 1100
Boston, MA 02114-2023

RE: Nuclear Metals Action Memorandum
MassDEP Support Letter

Dear Mr. Brill:

The Massachusetts Department of Environmental Protection (MassDEP) has received and reviewed the US Environmental Protection Agency's (EPA) Action Memorandum for the Nuclear Metals Inc. Superfund Site (Site) in Concord, Massachusetts dated August 21, 2008.

This Action Memorandum describes a non-time critical removal action (NTCRA) which will address the threats posed by the on-site deteriorating facility buildings and structures severely contaminated with depleted uranium. The NTCRA will include demolishing the buildings down to the slab foundations. The slab foundation will be temporarily capped pending future remedial actions.

According to the Action Memorandum, disposal of construction debris will either be off-site in an appropriately licensed facility or potentially on-site if such debris is found not to contain hazardous or radioactive substances. MassDEP has a policy regarding the on-site reuse and disposal of construction and demolition debris. We would like to participate in any evaluation of the potential on-site disposal of materials and would like to have this policy considered in the process.

MassDEP supports this NTCRA because it will accelerate the overall site cleanup by reducing the risk from the Site contamination. However, this NTCRA should not constitute the complete and final cleanup plan for the Site.

We look forward to continued coordination with EPA during the Remedial Investigation/Feasibility Study to evaluate the full nature and extent of contamination, and in the development of the subsequent Record of Decision for the Site.

Sincerely,

Jay Naparstek,
Deputy Division Director
Bureau of Waste Site Cleanup

cc: G. Waldeck, MassDEP

e-file: 080908 Action Memo Support